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## ORIGINAL COMMUNICATIONS.

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### THE DEAF CHILD—A PLEA FOR CO-OPERATION.

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Over twenty years ago I returned from two years of post-graduate study abroad, impressed not only with the achievements of otologic surgery and pathology, but with the new impetus that had been given by a few masters in this field to the education of the deaf. Urbantschitsch and Politzer in Austria; Bezold and Lucae in Germany; Mygind in Denmark; Gradenigo and Ferreri in Italy; Menier and Moure in France; Toynbee, Love and Yearsley in England.

I had been granted the special privilege of close study of the method suggested by Urbantschitsch for the re-education of the partially impaired auditory nerve, and followed with much interest his practical work in the Oberdoebbling Institute for the Deaf in Vienna. Before returning home I visited the Margate School for the Deaf with Dundas Grant in London, and had the pleasure of demonstrating the Urbantschitsch system for the first time to Mr. B. Thornton, the head master at Margate.

On my return home I found an opportunity for developing this oral system of training at the St. Joseph School for the Deaf in St. Louis. After two years of painstaking practice with a class of about sixteen pupils, I presented the practical results of the Urbantschitsch method, used in conjunction with the usual training of the deaf then

in vogue, at the meeting of the American Academy of Ophthalmology and Oto-Laryngology in St. Louis in April, 1897. This was the first presentation of its kind submitted to a medical assembly in America; it demonstrated two important features: First, that the otological profession had never assumed their share of the responsibilities in the important question of the training of the deaf, a field which is as much legitimately a part of otology as is the evolution of the mastoid operation, or the pathology of the labyrinth. It further proved that the education of the deaf was no exception to the rule of evolution, and that step by step progress was being made in the development of this department of educational work, as well as in the training and development of the normal child.

It cannot be gainsaid that progress in the education of the deaf child by a system like that advanced by Urbantschitsch must, of necessity, be very slow and also limited in scope. Its application is possible only in a selected group of pupils where some remnants of audition are still retained. It cannot be applied in the training of a totally deaf child, or even in the case of an adult whose hearing has been lost.

The Urbantschitsch method of restimulation of the auditory nerve by aid of the human voice received a further impetus by the researches of Bezold. The "continuirliche Tonreihe," (continuous system of tuning forks) was utilized by Bezold to determine the amount of hearing in each pupil whose auditory defect was sufficiently grave to require a special form of education. Bezold specified empirically his so-called "tone islands" by means of which a classification of the degree of deafness of each pupil was made possible. All pupils tested by the "continuirliche Tonreihe" whose hearing was less than that of the prescribed limitations of the tone islands (A of the middle register to G of the second octave above middle C) were designated as physiologically unqualified for education by any of the systems which are to-day recognized among the teachers of the deaf as oral methods.

To-day all progressive educators of the deaf recognize the importance of utilizing every remnant of hearing in the deaf child or adult, and all modifications of oral or auricular methods are a valuable adjunct in the education of a large percentage of deaf pupils. The results obtained by auricular methods are proportionately dependent on the amount of hearing in each pupil so trained.

There are three practical subdivisions or groups to which pupils may be assigned for auricular exercises. The first group includes pupils in whom the remnant of hearing is so slight that they are

enabled to distinguish only the sounds of the voice in sustained vowels at close range to the ear. In this class of pupils experience has proved that the application of auricular methods is of but little avail. Occasionally in exceptional cases, however, marked improvement in the hearing-power has been noted and for this reason every pupil of this group should be given every possible chance.

The second group includes pupils who may hear words or phrases in loud or even moderate voice at close range. Here the results obtained with the auricular method have often been brilliant, and teachers and aurists who fail to practice auricular training in pupils of this group are guilty of professional negligence.

Group three comprises pupils with such pronounced hard-hearing that they have difficulty in keeping up in classes with normal children. The causes of such defective hearing may be found in a destruction of the membrana tympani or in adhesions of the tympanic membrane to the promontory following marked pathological changes influenced by nasal obstructions or persistent, diffuse lymphoid or adenoid interference, oto-sclerosis, or constitutional, specific influences localized and characterized by a defective auditory nerve.

With individual attention and instruction this group of pupils may progress in scholarship almost as rapidly as the normal child. Unfortunately no provision is made, in our schools for normal children, for pupils with such hearing defects, and they are assigned either to the school for the deaf or to the special school. In the schools for the deaf they are placed in constant association with children with varying defects in articulate speech and the individual auricular training which such cases demand is often neglected.

In the special schools they are taught with the feeble-minded pupil and this association is of the utmost detriment to their progress. These children should be taught like normal children with the additional opportunity for individual instruction, and if possible special provision should be made for such groups in our public school-system.

It is to the important question of oral methods of teaching the deaf that I would especially direct your attention. Oral training in its broadest acceptance to-day comprises the teaching of speech and lip-reading to the deaf child, whether totally or partially deaf, and to prepare such a pupil for social intercourse, so that his method of communication is by actual speech and not by signs, manual, or pad and pencil, and his reception of speech is by sight as a substitute for his deficient or defective sense of sound. This is the foundation on which we are endeavoring to build the structure of

modern education of the deaf, and it is to the support of this movement that we are bending every energy to enlist you.

The education of the deaf child is an obligation and not a *charity*, and you, as otologists, are as much concerned in the upbuilding of this structure as are the progressive educators of the deaf, who have put forth their best efforts in this direction.

Have you ever thought what a splendid uplift the combined influence of the otological profession might be towards developing this vital question?

Individual efforts in the building of so formidable a structure as the modern education of the deaf requires, are but feeble, and it is only by concerted effort, interchange of opinion stimulating criticism and inquiry, and scientific research in which the entire otological world should participate, that we shall be able to accomplish larger things for a good and great cause.

I have sat in your assemblies long enough to realize with what persistency, energy, resourcefulness and brilliancy you have concentrated your studies on the development of the technic of the radical mastoid operation, the physiology and pathology of the labyrinth, and the study of the perplexing question of oto-sclerosis. May I plead with you to give only a small part of this energy and enthusiasm to the advanced training of the deaf, and I feel certain that the results obtained by such co-operative work and influence will repay you to even greater extent than your proud accomplishments in otological surgery and pathology.

At the sixteenth annual meeting of the American Laryngological, Rhinological and Otological Society held in Washington D. C., in April, 1910, a symposium was arranged at which a number of progressive educators of the deaf and a few of the otologists who had given some attention to this question, presented a series of valuable papers setting forth the status of the deaf child from every point of view and stimulating a discussion among the members of this organization, which lives to-day in the memory of many of the fellows as one of the best achievements of this great national special society.

Unfortunately this is but a memory and not a practical entity. It was the unanimous opinion of the large assembly of otologists and teachers of the deaf present at that meeting that this question was broad and national in scope and that it would probably require the concerted influence of educators and otologists from every section of the country for its larger and proper development.

When the International Congress met in Boston, in August, 1912, this, the senior assembly in otology for the first time in the history



of its organization included in its program a lengthy discussion of this question of the education of the deaf.

To those of you who were present at either of these meetings no further appeal is necessary to convince you of the seriousness of this problem and of the necessity for much thought and action in liberally providing for the deaf child with every resource at your command. The medical profession has been a potent influence in raising the standards of education and looking after the health and welfare of the normal child; the deaf child also demands a share of your consideration and a larger share of you, as otologists.

Another significant fact which must not be lost sight of is, that deafness is on the increase in this country and that better facilities must be provided for the proper care and development of this large class of unfortunates.

Stimulated by these efforts and examples as developed in our various otological assemblies, medical societies in some of the larger cities have given time and attention to this question in symposia in which the defective child, its proper disposal, classification, and education, was discussed from every angle. Such meetings were held in New York, St. Louis, Omaha and other cities.

To illustrate the practical significance of this participation by the general medical societies, the report of the special meetings in St. Louis, as described by the writer in an editorial in *THE LARYNGOSCOPE* of March, 1912, is presented herewith:

"An innovation, recently arranged under the auspices of the Saint Louis Medical Society, has created much favorable comment both from the medical and the lay press, and has proved so successful in its presentation that other communities and organizations may profitably follow this example.

"The DEFECTIVE CHILD" is the subject of a series of symposia arranged by a special committee of the Saint Louis Medical Society. Three evenings were assigned to this work: I. "The Deaf Child;" II. "The Mentally Defective and Crippled Child;" and III. "The Blind Child."

The following programs were presented:

#### I. THE DEAF CHILD.

The Deaf Child.....	Dr. M. A. Goldstein
Demonstration of Cases (By invitation).....	Mrs. J. T. Moss (Teacher of Lip-Reading)
Defects Due to Nasal Obstruction.....	Dr. W. E. Sauer
Lantern Demonstration of Cases and Pathological Specimens,.....	Dr. Eugene T. Senseney
Speech Defects: Demonstration.....	Dr. C. Armin Gundelach
Discussion opened by Mr. Ben Blewett, Superintendent of Instruction, St. Louis Public Schools.	

#### II. THE MENTALLY DEFECTIVE AND CRIPPLED CHILD.

General Consideration and Classification of Mentally Defective Children.....	Dr. Sidney I. Schwab
The State of the Mentally Deficient Child (By invitation).....	Mr. Hugh Fullerton (Secretary Juvenile Court of St. Louis)
The Relations of the Crippled Child to the Community from an Orthopedic Standpoint.....	Dr. Nathaniel Allison

Special Schools for Crippled Children, with lantern slides demonstrating Children's Work (By invitation).....Miss Julia Stimson  
(Administrator of Social Service, St. Louis Children's Hospital)  
Discussion opened by Mr. Roger Baldwin, Chief Probation Officer, Juvenile Court.

### III. THE BLIND CHILD.

Prevention of Blindness.....Dr. M. H. Post  
Heredity of Blindness.....Dr. Clarence Loeb  
Training of Blind Children (By invitation).....Mr. S. M. Green  
Errors of Refraction in School Children.....Dr. John Green, Jr.  
Discussion opened by Dr. James Stewart, Superintendent Department of Hygiene, St. Louis Public Schools.

"The essayists selected to present this subject-matter were asked to prepare their papers in a popular form, and to eliminate, as much as possible, purely medical technicalities. Special invitations to these meetings were issued not only to the members of the medical society but also to that class of the laity especially interested in child-welfare work and communal progress. The Superintendent of Public Instruction, the members of the Board of Education, the principals of all the public schools and teachers in the Special Schools of Saint Louis, the officials and members of the various organizations represented in the Child-Welfare Association, the judges and officials of the Juvenile Court, the president of Saint Louis, Washington, and Missouri State Universities, the Superintendents of the State Institutions for the Deaf, the Blind, and the Mentally Defectives, and the prominent charity workers and civic representatives were invited to attend these sessions.

"If the thoughts, energies and good-will offered by the several essayists, who have so enthusiastically advanced this program will produce their just reward, another step in the development of this important phase of educational and communal endeavor will have been taken. There seems to be a constantly growing interest in the problems that confront us concerning the care and proper disposal of the defective child. Statistics corroborate the assertion of the tremendous increase in the defects of sight, speech, and hearing, and in the mental and physical infirmities of the American child, and it is not only opportune but vitally imperative that the medical fraternity co-operate with educators, with social and charity workers and with all others of the laity who are beginning to realize the responsibilities of this serious question.

"At the last annual meeting of the National Educational Association which has just concluded its session in Saint Louis, and where representatives of all the important educational institutions were active, the question of the education of the defective child, his proper disposal and his segregation, was one of the most prominent topics for discussion. Much of the data and information necessary for an intelligent comprehension of this question by the layman can be furnished only by the medical profession, and we should cheerfully and energetically assume our share of the work to stimulate investigations which will help solve these complicated questions."

For an extensive co-operation, in which the interests of the medical profession, educators of the deaf, school authorities, boards of education, court officials, social service workers, and the intelligent laity are involved and enlisted, it is absolutely necessary that more

of such practical and significant missionary work be done. I appeal to you all to develop further activities along these lines, so that every city and every community far and near may be in a position to assist in this worthy campaign.

Another phase of this question which is certain to prove a valuable adjunct in developing this cause is a resolution adopted at the meeting of the Section on Otology and Laryngology of the American Medical Association, in 1909, and indorsed by the American Laryngological, Rhinological and Otological Society, the American Otological Society and by the American Academy of Ophthalmology and Oto-Laryngology.

The special committee in charge of this work has carried out the first obligation placed upon it by sending a syllabus on the education of the deaf to every medical school in this country. As a matter of record and reference, the complete syllabus is here appended, together with the letter addressed to the deans of all the medical schools of the United States and Canada.

New York City, May 24, 1911.

Dear Doctor: At the annual meeting of the American Medical Association in 1909, a committee was appointed by the otological section, to draft resolutions and devise means for arousing increased interest among the members of the medical profession in the cause of ameliorating the condition of deaf children by education, and to report at the next meeting. The report of the committee as made at the meeting in St. Louis in 1910, and its accompanying resolutions were adopted and the committee continued by the section for the purpose of endeavoring to carry out the intent of the resolutions. One of these reads as follows: "That in all medical schools more instruction be provided during the course on the means available for ameliorating the condition of deaf children by education."

The committee feels confident that the schools will gladly adopt this suggestion, if such instruction is not already included in the course. They realize, however, that the lecturers upon whom this duty would devolve, are very busy men, and might find it a hardship to spend the time necessary to gather the material for such a lecture. The committee has, therefore, prepared a syllabus containing the essential facts that such a lecture might set forth, and takes pleasure in enclosing this booklet for reference should the lecturer choose to avail himself of it.

The committee hopes that the arrangement of the course will permit the lecture to be given during the graduating year, and that the students will be urged to make such notes for preservation as may enable them to intelligently advise cases that may from time to time come under their observation, since it is to the physician that the parents of the afflicted children first go for help, advice and guidance.

The committee would greatly appreciate the courtesy of a reply stating whether such a lecture is already a part of the course, and if not, that it will hereafter be included.

Cordially yours,

JOHN L. ADAMS, Chairman.  
B. R. SHURLY,  
DUNBAR ROY,  
MAX A. GOLDSTEIN,

Committee of the Otological Section of the American Medical Association.

## SYLLABUS ON THE EDUCATION OF THE DEAF.

Distributed among the Medical Schools of the United States and Canada by the Otological Section of the American Medical Association, through a committee consisting of Dr. John L. Adams, Chairman, New York City; Dr. B. R. Shurly, Detroit, Michigan; Dr. Dunbar Roy, Atlanta, Georgia; Dr. M. A. Goldstein, St. Louis.

**Topical Analysis of Syllabus—Educational Treatment of the Deaf.**

I. a. Historical Review: 1. Europe. 2. America. b. Present Status: 1. Europe. 2. America.

II. Comparison of Manual and Oral Methods: 1. Results of Manual Method. 2. Results of Oral Method. 3. Results of "Combined" Method. 4. Failure of "Combined" Method from a speech standpoint.

III. Classification of Cases: 1. Congenitally, totally deaf: 1. Of normal intellect. 2. Of subnormal intellect. 2. Adventitiously totally deaf: 1. Of normal intellect. 2. Of subnormal intellect. 3. Profoundly, but not totally deaf. 1. Of normal intellect. 2. Of subnormal intellect. 4. The Deaf-Blind. 1. Of normal intellect. 2. Of subnormal intellect. 5. The Hard of Hearing in the public schools.

IV. Educational needs of each class.

V. Sources of information open to those interested.

## SYLLABUS ON THE EDUCATION OF THE DEAF.

The systematic education of the deaf began with the establishment of a little school in Paris by the Abbe de l' Epee in 1755, which he supported with his small personal income. Previous to that time, during the sixteenth and seventeenth centuries in Spain and England there had been occasional cases where the deaf sons and daughters of nobles, or persons of great wealth, had been educated and even taught to speak and read the lips by clever and devoted men, but the good Abbe de l' Epee was the first to offer the boon of education to the poor and rich alike. He, however, adopted a method of instruction by gestural signs and manual alphabet. About the same time Braidwood in Edinburgh (1760), and later in London, and Heinicke in Dresden (1778), were teaching by oral methods, but they, unlike the French Abbe, made a secret of their methods, and taught only the rich.

The first school in the United States was opened in 1817 at Hartford, Connecticut, and Thomas H. Gallaudet was its Principal, he having been sent the year before to Europe to train himself for his work. Mr. Gallaudet had sought the necessary instruction in Edinburgh and in London, but had been inhospitably received. In Paris, however, at the institution founded by the Abbe de l'Epee, and then conducted by the Abbe Sicard, his reception was most cordial. Therefore it was the sign language and the manual method which he brought back with him, and established in the first school for the deaf in this country. For half a century the education of the deaf in the United States was carried on exclusively by the silent methods imported from France by Mr. Gallaudet.

But in the meantime oral methods were coming to predominate in Europe, and in 1867, two small oral schools were opened in this country, one in New York City, and one in Northampton, Massachusetts. By oral schools is meant schools in which no manual form of communication, either gestural signs or finger alphabet, is taught or used by teachers or pupils in or out of the school room. All instruction or communication is spoken, except that writing is employed as it is in any ordinary school for hearing pupils. Gradually the teaching of speech and lip-reading to the deaf has made its way into the schools of this country, until more or less of this work is done in every school.

We have seen that at the very start there was a wide divergence in the matter of methods. In Europe, however, the oral method has come to be nearly universal, while the United States is the stronghold of manualism. The last international report of schools for the deaf was issued in

1901. The following table will show the status of oral and manual methods in Europe at that time and in the United States and Canada in 1910.

	No. of		No. Taught in		Per
	Schools	Oral Schools	Total Pupils	Pure Oral Schools	cents
Austria Hungary ....	38	33	2339	1947	84%
Belgium .....	12	11	1265	1206	95%
France .....	71	62	4098	3785	92%
Germany .....	99	99	6497	6497	100%
Great Britain .....	82	60	4222	2110	52%
Italy .....	47	38	2519	2044	82%
Norway .....	5	5	809	809	100%
Holland .....	3	3	473	473	100%
Russia .....	33	20	1719	949	56%
Spain .....	10	3	462	172	37%
Sweden .....	9	2	726	131	18%
Switzerland .....	14	14	650	650	100%
Totals .....	423	350	25279	20273	Average 80%
1910 .....					
United States .....	145	82	12332	2809	22%
Canada .....	7	2	832	220	26%
Totals .....	575	434	38443	23302	42.66%

There are many schools in the United States, and some in Europe, that call themselves "Combined." That is they do some work in speech and lip-reading, and many of them have some classes in which all instruction is oral. But in many of the class rooms, and in outside communication, signs and the finger alphabet are taught, used and permitted. But experience has clearly shown that the best results in making speech and lip-reading a practical, working means of communication, cannot be obtained under the conditions existing in these "Combined" Schools. The manual method of communication is easier of acquisition for the child, and spoken language does not become his thought vernacular; he thinks in manual forms and expresses himself silently by choice. In the "Combined" Schools the manual "atmosphere" is all pervasive, and even coercive, for the child cannot avoid it. Therefore, the most satisfactory oral work cannot be done under "combined" conditions.

There is, probably, only one way in which the most satisfactory oral work possible can be done in a school in which there must, for any reason, be manual classes, and that is to make two schools of it, both under the same management, but the oral and manual classes having separate class rooms or different hours, and separate living quarters, and never coming in contact with each other at any time during the day. The largest school for the deaf in the world, the Pennsylvania Institution, in Philadelphia, has in this way been changed from a manual to a purely oral school, but the process occupied more than twenty-five years. The beginning was made by separating the school into two parts, a small oral department and a large manual, the pupils in the two departments never associating with each other in work or in play. Little by little, as the results of the oral work proved themselves satisfactory, the size of the manual department was decreased and the oral enlarged, until there are now no manual classes, and all communication in and out of the class room, in shop work and recreation, is spoken. Dr. A. L. E. Crouter, the Superintendent, in his annual report for 1909-1910, writes as follows: "In the Intellectual Department, instruction has, in the main, been conducted along the same lines as in previous years, the only noteworthy changes being the increased attention paid to lip-reading, and the entire absence of all forms of Manual Methods. These changes are believed to have proven helpful in the work. Oral Methods alone are now pursued in the instruction of all our pupils, and they are found quite adequate to their best advancement. In saying this, we do not claim to be able to make orators or public speakers of our pupils, but we do claim to be able to give them a good general education, and in doing so, to train their powers of speech and lip-reading to the extent of enabling them to communicate freely with their relatives and close friends, and to express their thoughts in fairly correct English on all topics of general interest. Except in a comparatively few cases more than this may not wisely be claimed for any method. Any method of instruction that will give the average deaf child a fair command of his native tongue, a fair acquaintance with the subjects that constitute a fair English education, and the power to speak intelligibly and to read the speech of others, is a good method, and any method that falls short of this, by whatever name known, is not a good method. We have dropped Manual Methods because we have found them unnecessary, and because we believe they interfere with the best progress of our pupils in the acquisition of speech and lip-reading and in all regular branches of study."

Thus once and for all, in the most conservative and practical way, has the country been shown how it may, if it wishes, gradually abandon the older and less desirable method for that which is more in keeping with modern ideas of education. The feasibility and desirability of this change having been demonstrated beyond question, without hurry and without prejudice, purely as a matter of indisputable fact, the same result can now be obtained in any other school in a period of not more than eight years. All that is necessary is the willingness on the part of the citizens, expressed by legislative action, to defray the slightly greater expense, and the placing in charge of a competent and experienced man or woman. Eventually this will be done, but not until a considerable body of public opinion is created by informing the people of the advantages possible to their deaf children, at present open to those in some states, but denied to those of others less enlightened. A great step toward this end will be accomplished if education can ever be removed from the sphere of politics, and appointments made on a basis of educational efficiency and not political service.

An examination of the very careful statistics that are issued each year both by the "American Annals of the Deaf" and by the "American Association to Promote the Teaching of Speech to the Deaf," shows that in addition to the "22% (2809) pupils, taught in 1910, in pure oral schools, 38% (4753) of the pupils in combined schools are put down as 'taught wholly or chiefly by the oral method.'" Thus on the face of the returns it would appear that some 60% of the pupils in United States schools are taught by oral methods, which is not so far behind the 80% in European schools. The advocates of the oral method have, therefore, made sufficient impression upon the authorities of the "combined" schools to lead them now to try to give 38% of their pupils the benefits of that method that began in this country half a century later than the manual method.

But the 60% is deceptive for the reason, given above, that it is impossible to have the true oral spirit among the pupils, (to say nothing of the teachers), under the mixed or "combined" conditions. In fact this apparent growth of the oral method has been in some degree a hindrance to true oral progress, paradoxical as that may seem. For the sending out into life of these thousands of deaf young people who are supposed to have been orally educated, but who, owing to their familiarity with manual means of communication, have never learned to think in spoken forms and to depend upon them for their real working means of intercourse with those around them, and have, therefore, found their oral equipment insufficient for the purposes of life, has resulted in making them bitter against what they mistakenly believe to be oralism, and in turn has caused those with whom they associate to look upon such instruction as unsuccessful and futile.

The existence of this large and yearly increasing number of deaf persons partially taught by oral methods is, in a measure, a hindrance to the growth of the best oralism. It would be better for the deaf if each of the "combined" schools could be made into two separate schools, a manual and an oral school, under the same or separate management, but segregating the manually taught from the orally taught throughout the entire period of school life. Such a procedure is probably the only one by which the conditions can be secured that are necessary for the best possible results.

For educational purposes deaf children and young people should be divided into five general classes, and every physician should be familiar with the necessities and possibilities of each class. Each of these five general classes should in turn be divided into two classes, those of normal intellect, and those of subnormal intellect. The placing of deaf children of subnormal intellect in classes with deaf children of normal intellect should not be tolerated any more than it would be in the case of hearing children.

Class I. The totally and congenitally deaf, and those adventitiously deaf before three years of age: (a.) Of normal intellect; (b.) Of subnormal intellect.

Class II. The adventitiously deaf after three years of age. (a.) Of normal intellect; (b.) Of subnormal intellect.

Class III. The profoundly, but not totally deaf: (a.) Of normal intellect; (b.) Of subnormal intellect.

Class IV. The blind deaf: (a.) Of normal intellect; (b.) Of subnormal intellect.

Class V. Somewhat hard of hearing pupils in public schools for the hearing.



Those in Class I will be dumb as well as deaf unless they are given special instruction in speaking, and this instruction should be systematically begun between four and five years of age in the case of the otherwise normal child. The subnormal child may wait a little longer. Parents and friends can do much to prepare the little one for this systematic instruction, and later in this syllabus sources of information on this subject will be enumerated. These children should be treated as hearing children, so far as instruction in manual communication is concerned. That is to say, they should not be taught the manual alphabet or gestural signs, and the spoken word should be taught as quickly as possible to take the place of the child's natural descriptive and indicative gestures. The human race has for thousands of years acquired its spoken form of communication between the years of two and eight, and the immense aid of inherited tendency is strongest during that period, and all possible advantage should be taken of this fact.

The deaf child beginning at four or five years of age can be given in any school for the deaf in the world a good "grammar school" education in the three R's and in History, Geography, and Industrial training. In addition to this he can, in any of the good Oral Schools, be given a degree of proficiency in speaking and understanding the speech of those with whom he is thrown in frequent intercourse, to make him entirely independent of any form of manual communication. This cannot be done in any so-called "Combined School." It is to be hoped that the states will gradually recognize the fact that a good oral school can accomplish all that a good "Combined" school can do, and in addition to this a very considerable and very desirable excess of result that is clear gain.

In the case of deaf children of Class II, those adventitiously deaf after three years of age, the most essential thing for the physician to know is that extremely prompt measures must be taken to prevent the loss of the already acquired speech. The absolute necessity for immediate action cannot be too strongly impressed upon the parents or guardians of the child. Extraordinary efforts should be made to induce the child to talk as much as possible. If the child has learned to read before hearing is lost he should be encouraged to read aloud a great deal. The greatest care should also be taken to lead him to always watch the lips of people, and his friends should accustom themselves to being sure that his eyes are directed to their lips before they speak to him. They should also speak a little more deliberately in addressing him for the first year, but carefully avoid exaggerated and unnatural mouthing of words. Perfectly normal speech should always be used, a little more deliberate, and only when the child's eyes are focused on the lips of the speaker. While special instruction may not be required at once, it is very desirable that the parents should seek the advice and guidance of some experienced oral teacher of the deaf the moment they know that hearing has been impaired. If proper methods are employed with sufficient promptness, the transition from comprehending speech through the ear to reading it by the eye may be made so gradually and simply, and the natural speech of the child may be so well preserved that there will be but little interruption of educational or social activities. Without this prompt attention, however, the child of eight, or less, will become a deaf mute if hearing is lost, and have to be treated in accordance with those of Class I. Unfortunately there are many such at present in schools for the deaf throughout the country.

The children of the third group, while too deaf to attend the ordinary public and private schools, yet retain some remnants of hearing which can be utilized in teaching them to modulate their voices, and in comprehending language spoken very loudly near the ear, or through some electrical or mechanical aid to the hearing. This class is probably much larger than is usually supposed, since a degree of sound perception sufficient to permit of educational training to usefulness, may yet be too small to be considered of practical value by either the possessor or his friends.

There are probably many pupils in the schools for the deaf of the world, with a sufficient power of sound perception to be taught to discriminate vowel sounds, and therefore words, spoken loudly near the ear, who have never so comprehended language because they have never been taught to do so. The schools cannot be blamed for this, because such work must be almost entirely individual, and the appropriations do not permit of employing the necessary teachers. It would be, however, a valuable mental training, for when the ear avenue to the brain is wholly closed, there must be an area which can never be developed through a vicarious sense, and any stimulation that can reach the brain adds to the completeness of its development. To acquire a hearing vocabulary, by means of an imperfect auditory apparatus, is somewhat akin to acquiring a new language over a telephone that is not working very well. Whether the actual perception of sound is increased by the training is not always certain, but the effect is the same, owing to the increased ability to interpret the meaning of the imperfect sounds perceived. Urbantschitsch of Vienna



has done much work on this line and written of it. The reason why this remnant of hearing does not develop spontaneously, is because there is not enough of it to serve any useful purpose under the ordinary conditions of conversational intercourse. Therefore the disconnected and meaningless sounds which from time to time reach the child's brain are simply ignored. We are all familiar with this failure to hear sounds when attention is not given. The clock strikes the hour, but we do not notice it. The impression was made upon the hearing mechanism, and transmitted to the brain, but the mind was otherwise occupied. We ourselves ignore hundreds of sounds daily so completely that to all intents and purposes we are deaf to them. We really hear with our minds through the medium of the ear and its associated parts, and when the mind fails to perform its function we are as truly deaf as though the mechanism of the ear were destroyed. The result of this auricular training with profoundly deaf children who still retain some power of sound perception is to lead them gradually to notice sounds which have always reach them, but had been ignored as meaningless and without value or interest. When these sounds acquire a significance they at once become interesting, and attention is paid to them, and we say how much better they hear. Whereas the actual sound perception may not have altered, but they have learned to associate ideas with sounds which they could have heard before, but ignored as meaningless.

The Fourth Class, those both blind and deaf, require a somewhat different treatment from those who are only deaf, and also even more individual attention. Manual means of communication must be very largely employed in their education, though they can be, and should be, taught to read the lips of speakers with the aid of their fingers, and be taught to speak themselves even to those who spell manually to them.

In general each child requires an individual teacher. The first case of this kind that was rescued from the terrible oblivion of the double misfortune was Laura Bridgman, who was given a meager education, and a little industrial training, by the great educator of the blind, Dr. Samuel Howe. The most famous case is probably that of Miss Helen Keller, who, through the devoted labor of Miss Annie Sullivan, now Mrs. Macy, and later of other teachers, has become a scholarly, cultured woman of rare intellectual powers and sweetness of character. She has a far more extensive education and a wider knowledge than the average young woman college graduate. She herself uses only speech in her communication with those around her, though others usually spell manually to her. She can, however, read the lips with considerable facility by the aid of her fingers.

There are now many deaf-blind children under individual instruction in schools for the deaf and schools for the blind in the world. Last year the State of Pennsylvania made a special appropriation for the instruction of a deaf-blind girl at the Pennsylvania Institution in Philadelphia.

The Fifth Class, the slightly hard of hearing pupils in the regular public schools of the country, is much larger than is usually known, and almost entirely neglected. They are in no sense candidates for a special school for the deaf, and yet they are too deaf to work properly in classes of forty or fifty to a single teacher. They usually come gradually to be classed as, dull, stupid, backward children. Sometimes they are, but often they are of fully average, if not exceptional, ability. All that is needed to enable them to do the regular work of the graded school in the ordinary way is to give them more individual attention in smaller classes. There should be provision for such a class in every large public school, and it should not exceed fifteen pupils. It has been found that among the 600,000 school children in New York City, one in each hundred has hearing sufficiently impaired to be severely handicapped under the ordinary conditions of the City's schools. In each of these schools there are usually from twelve hundred to two thousand pupils, so that a class of from twelve to twenty would be provided in each school building. Great care should be taken that no stigma is attached to such a class. The arrangement should be such that they would not be looked upon as feeble-minded, or defective, otherwise much difficulty would be experienced in carrying out the plan successfully. They should do exactly the same work in the same time as is done in the other larger classes.

Physicians desiring detailed information on any point touching the welfare of the deaf, aside from medical matters, can obtain it from the following sources: The "Volta Bureau for the Increase and Diffusion of Knowledge Relative to the Deaf," and "The American Association to Promote the Teaching of Speech to the Deaf," both of Washington, D. C., both established by Dr. Alexander Graham Bell, the distinguished inventor of the telephone. The "American Annals of the Deaf," Kendall Green, Washington, D. C. Prof. John Dutton Wright, editor of the special department for the Deaf in "THE LARYNGOSCOPE," St. Louis, Mo. Dr. John L. Adams, 33 East Fifty-first Street, New York City, Chairman of a committee appointed by the Otological Section of the American Medical As-

sociation. Dr. E. B. Dench, 15 East Fifty-third Street, New York City, Chairman of a committee appointed by the American Otological Society and the American Laryngological, Rhinological and Otological Society.

A list of schools in the United States and Canada will be found in "THE LARYNGOSCOPE," St. Louis, Mo., for December, 1910, and in the "American Annals of the Deaf," Washington, D. C., January, 1911, and in the "Volta Review," Washington, D. C., May, 1911.

It is difficult to ascertain how active the co-operation of the medical departments of the universities have been in response to this appeal. Many endorsements of this resolution have been received from various universities, and many of the otological departments, have agreed to devote at least one lecture to each graduating class on the care, disposal and education of deaf children. The purpose of this lecture is to call attention to the responsibility of each physician in his community in his relation to this question. Much of the necessary stimulus needed in this missionary field depends, of course, upon the personal equation of each lecturer and the amount of interest he may take in informing himself as to the needed data for such address.

The ideal way to reach the senior student and to post him accurately in this matter would be for a small number of specially qualified authorities in this work to make the circuit of the medical departments of the universities and give comprehensive talks to the student-body each year.

It is very evident from the meager response of otologists to this movement in the past that but little energy and thought has been applied to this field of work. Impelled by the promised co-operation of a number of progressive educators of the deaf and prominent otologists from various medical centers in America, representing two professions vitally concerned in this field, the establishment of the Central Institute for the Deaf was undertaken, even though it appeared a Herculean task. We well realize the difficulties that are before us. There are many contentions to overcome in any new movement, especially one of an educational character, and when a strong conservative element still endeavors to maintain its position and impede the natural upward and onward evolution in child-training.

A handicap of no slight degree is also to be found in the apathy with which the otological profession has until now treated this important subject. It is only by actual, practical demonstration and a knowledge of the thorough soundness of the foundation on which we are building that we hope soon to overcome these two most apparent obstacles. We must convince the conservatives among the teaching profession that the principles of the advanced training

which we advocate are sound and practicable, and that the results already achieved by oral and auricular methods offer advantages and opportunities to the deaf which have never been realized by the advocates of the manual and combined systems.

The indifference of the otologist is rapidly disappearing, as evidenced by the increasing interest shown from year to year in the practical demonstrations which have been offered at national assemblies and the liberal discussions which the subject of the deaf child have evoked. In order to make this propaganda effective, however, we need active, individual support rather than mere passive encouragement.

The scope of the Central Institute for the Deaf is a rather comprehensive one. We have widened it to meet the needs of as many classes of deaf children and adults as possible, to furnish data and statistics of this field of endeavor to the medical profession, to teachers of the deaf, and to the interested laity, and to provide normal training for the equipment of teachers properly qualified to carry on this work efficiently and effectively.

I have endeavored to present in chronological order the efforts that have been made to bring this question to your more serious attention, and to show the breadth and importance of its scope and the many influences and interests that are necessary to bring such a nation-wide movement to a successful issue. The results possible in this progressive campaign in the interests of the deaf will depend mainly on the numerical strength that can be enrolled and of the otologists and the general medical profession as a supporting factor in this worthy cause.

I appeal to each and every reader who may be sufficiently impressed by the presentation of the work thus far done and the intrinsic merit of the cause we represent to volunteer his personal support at every opportunity and in every possible way. Our cause will gain strength with every effort you exert, no matter how slight. We feel that we are on the threshold of a big movement, and its future strength will to a great extent be measured by your concerted influence.

3858 Westminster Place.

## A CONTRIBUTION TO THE STUDY OF THE ANATOMY OF THE TYMPANIC CAVITY.\*

DR. RALPH BUTLER, Philadelphia.

Much has been written of the gross and microscopic anatomy of the human tympanum but sections of this part of the middle ear show so much of undescribed detail and have been so inadequately illustrated that additional drawings from such sections may be studied to advantage.

The accompanying illustrations were made from microscopic sections of the human tympanum prepared by the author in the McManes Laboratory of the University of Pennsylvania. The usual methods of hardening, decalcifying and imbedding in celloidin were employed and cuts were made in the planes which seemed to be most instructive.

The drawings are arranged in three series. The first contains nine illustrations of coronal sections; the second, four of a sagittal series; and the rest are horizontal, thus showing the relations in three planes approximately at right angles to each other.

In the coronal sections, Figures 1 to 11 inclusive, it is interesting to observe the changes encountered as we pass from the posterior part of the tympanum, as illustrated in Figure 1, to the anterior section depicted in Figure 11. The facial nerve lies directly above the stapedius muscle in the posterior sections and above the tensor tympani in the anterior, thus bearing a similar relation to the two muscles of the tympanic cavity. In the former it lies just below the external semi-circular canal and is overhung by it. The writer has frequently found the bony separation between the nerve and the muscles to be incomplete in certain sections and has previously demonstrated a large branch of the nerve supplying the stapedius.

The broad normal fibrous ligament of the short process of the incus at its tip, as illustrated in Figure 1, is in marked contrast to the delicate attachment, found further anteriorly, Figures 2, 3, 4 and 5, consisting of two layers of mucous membrane, be-

\*Candidate's thesis presented at the twentieth annual meeting of the American Laryngological, Rhinological and Otological Society, Atlantic City, June 20, 1914.

tween which is seen a little fibrous tissue and an occasional blood vessel extending between the scutum and the incus.

The wedge-shaped bony partition between the epitympanic cavity and the external auditory canal, called by Leidy the scute and formed by the squamous portion of the temporal bone, is best illustrated in Figure 9. The destruction or removal of this septum gives us an unobstructed clinical view of the mal-

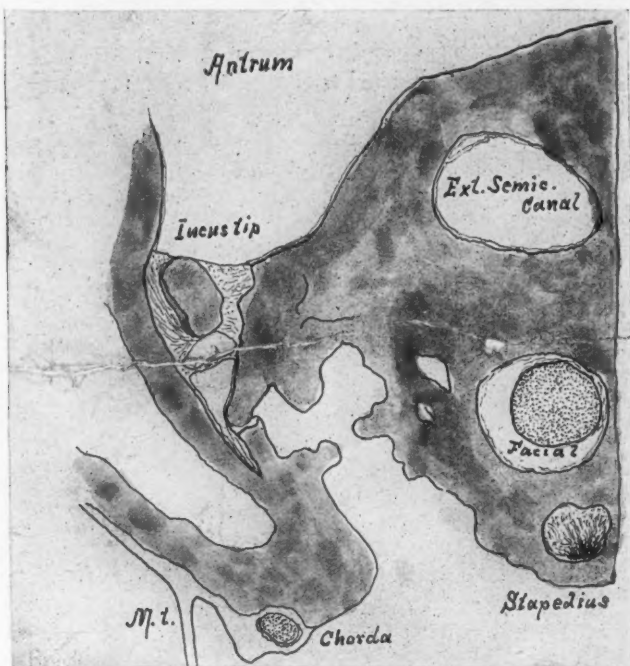


Figure 1.

leus head in its normal position and affords better access to the attic.

Attached to the lower part of the scute is the fold which forms the inner boundary of v. Troeltsch's pouch and suspends the chorda tympani nerve. In Figure 5 it encloses a plate of bone which is probably the free tip of the posterior spine of the annulus. Although it is poorly illustrated in this series, Figure 6, the author has usually found an attachment of this

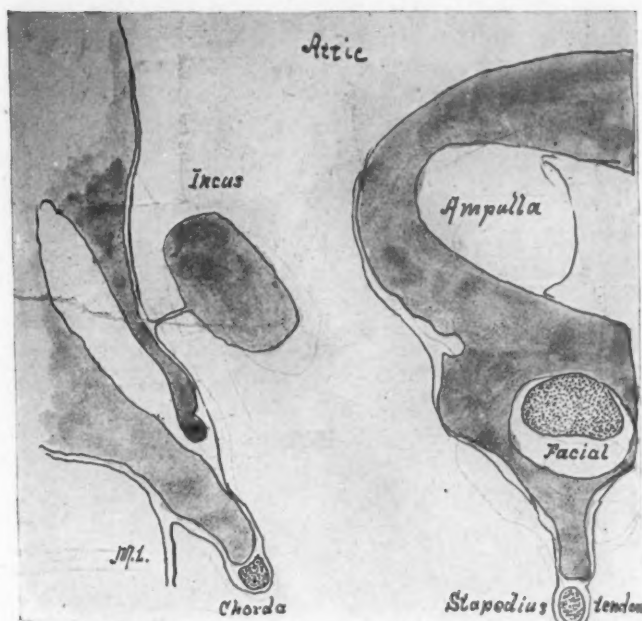


Figure 2.

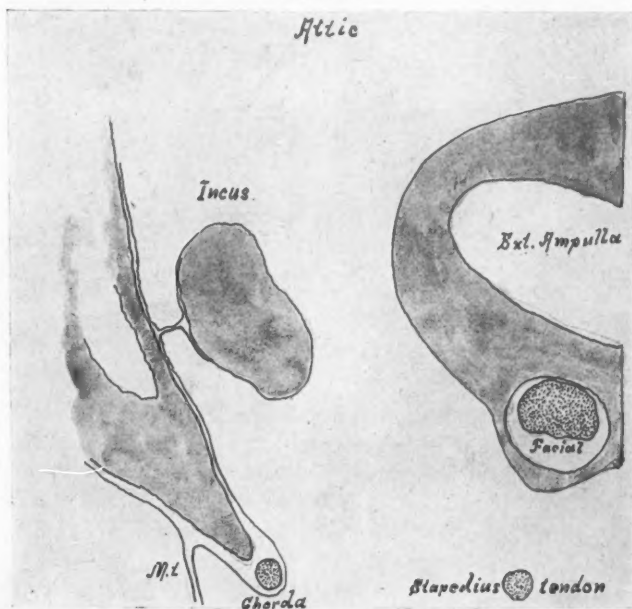


Figure 3.



fold and the chorda to the incus shank, as maintained by Brunner and Henle. This fold and chorda are also illustrated in the horizontal section, Figure 16.

External to the attachment of this fold is found the upper margin of the membrana tympani. The drumhead has an in-

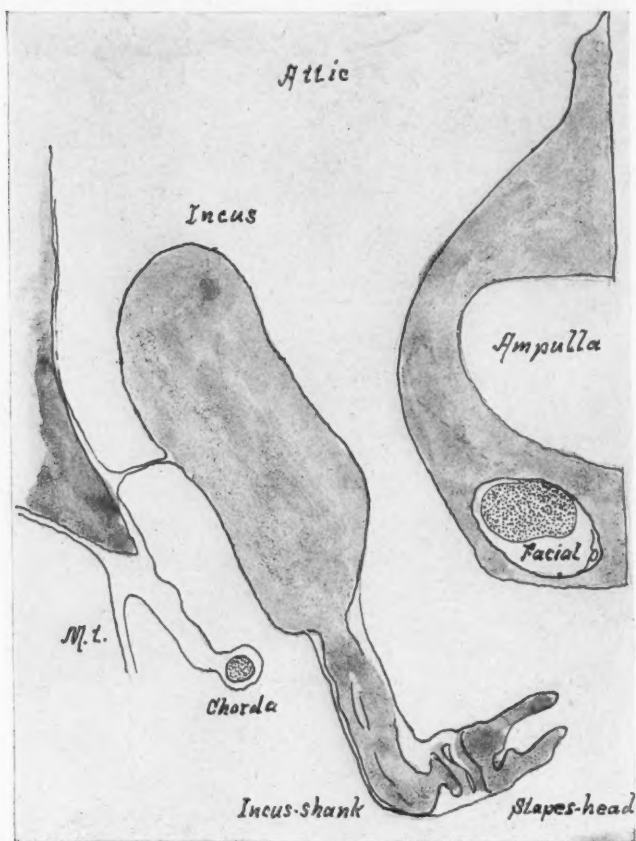


Figure 4.

dependent attachment to the Rivinian margin in the posterior, Figures 1, 2 and 3, and again well forward as in Figure 9, while in Figures 4 and 5 the attachment is in combination with that of the posterior fold, and in Figure 10 with the external ligament of the malleus.



Schwalbe claimed that the external ligament of the malleus and the flaccid membrane originate from the scute at two distinct points. Kretschmann maintained that they were combined for a short distance. Merkel considered Schwalbe's observation the usual one and Kretschmann's the exception. In this series we find them widely separated in some sections as Figure 9, while

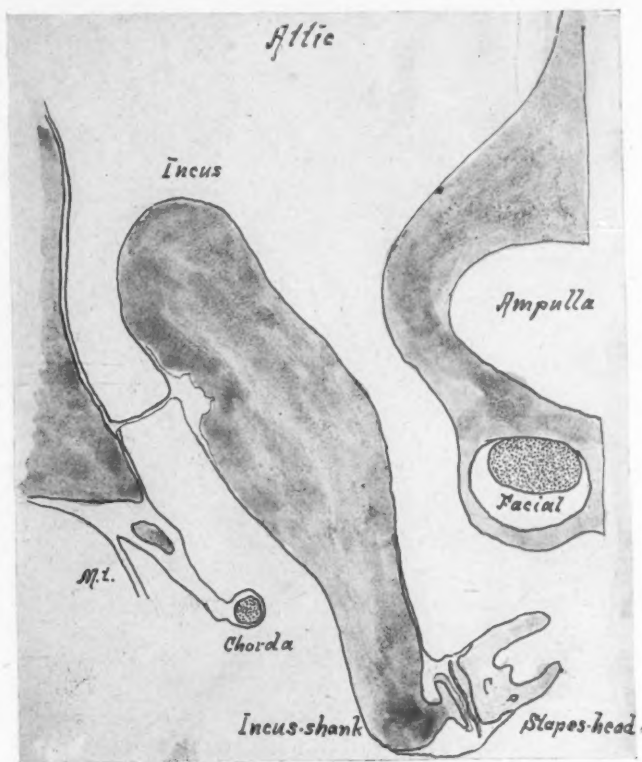


Figure 5.

further forward as in Figure 10 they are combined for a short distance. As Merkel has maintained it would be impossible to have a perforation from the outer attic though this part of Shrapnell's membrane in a case such as illustrated in Figure 9 without entering Prussak's space, but in the one shown in Figure 10 such a perforation is conceivable.

Although the malleo-incudal joint is more clearly shown in horizontal and sagittal sections, the coronal cut, Figure 7, shows the malleus head lying between two portions of the incus body and presents an unusual view of the incus cog.

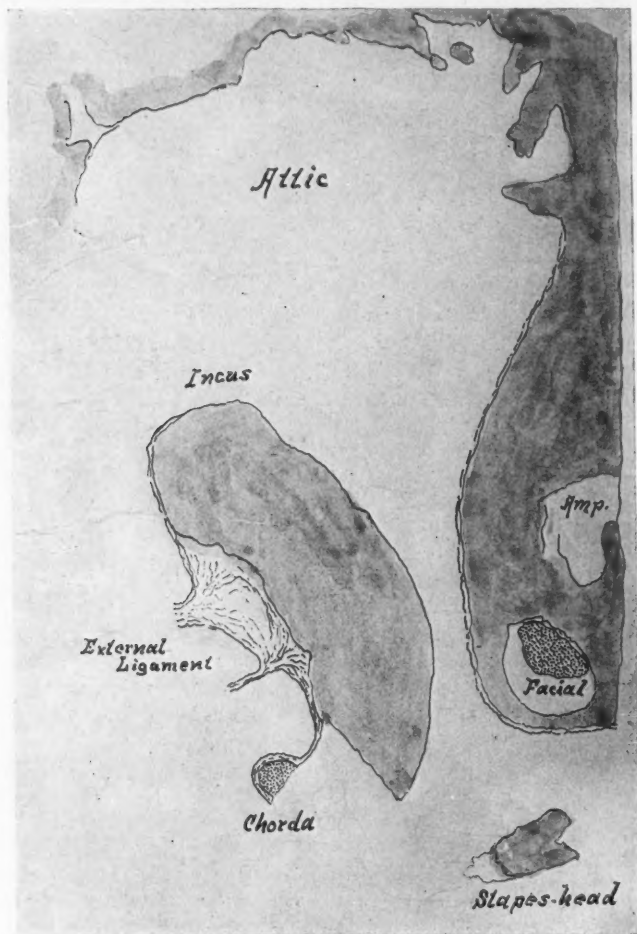


Figure 6.

The form, comparative size and relations of the contents of the tympanic cavity, as they occur in the sagittal plane, are illustrated in sections 12 to 15 inclusive.

The tegmen tympani is well shown in this series and forms in the central sections an angle of about 65 degrees with the upper surface of the malleus and incus and constitutes one side of the triangular space between it and these ossicles.



Figure 7.

Extending from the tegmen to these ossicles is usually found a more or less extensive suspensory ligament or fold, known as the suspensory ligament of malleus and incus. Although the anterior part, known as the suspensory ligament of the malleus has been described as a thread-like band, the writer has usually found it extending well over the malleus head and merging with the anterior fold and occasionally prolonged backward

over the incus as a falciform membrane. In this group there is no suspensory ligament in the outer three cuts, but the inner ones as Figure 15 contain a stout band of fibrous tissue enclosing a plate of bone and extending from the tegmen to the upper

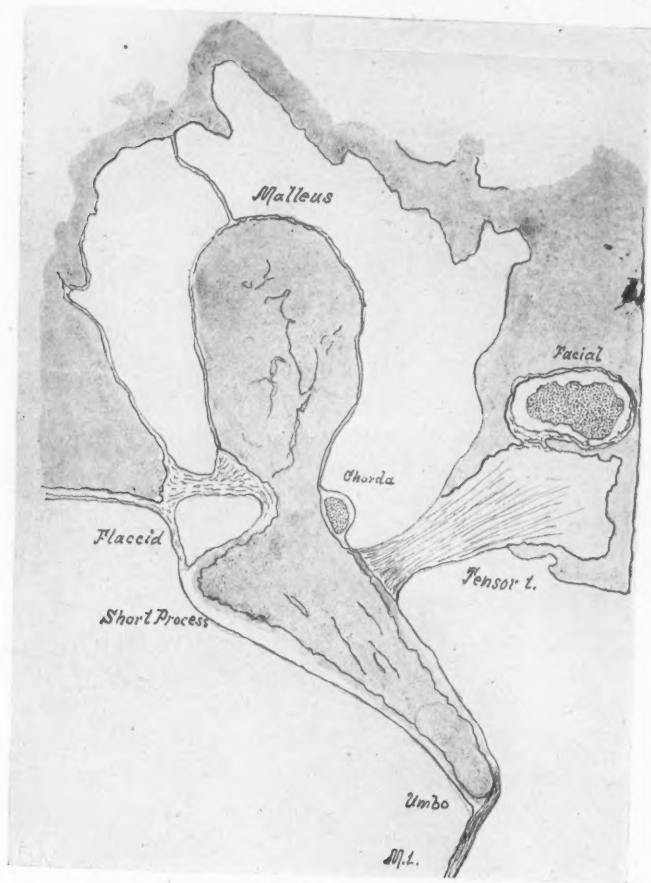


Figure 8.

part of the capsule of the malleo-incudal joint.

In Figure 12 the chorda tympani nerve is seen between the incus shank and the malleus handle just above the attachment of the posterior fold of the drumhead. More internally, Figure 13, it is intersected at two points as it bends around the malleus,

a part appearing on either side of the ossicle. Its relation to the malleus neck and tendon of the tensor tympani is depicted in Figures 8, 10 and 11.

Not infrequently horizontal sections of the short process of the incus show a separation of the tip from the main

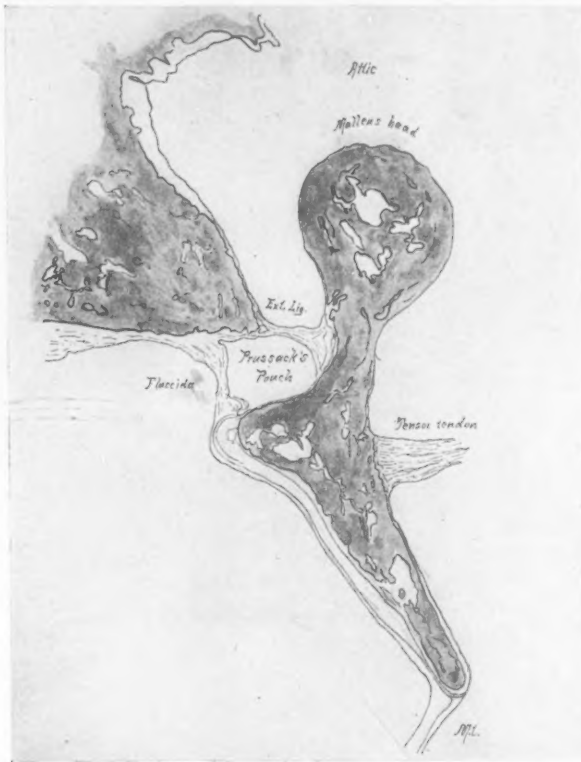


Figure 9.

part of the bony process. This is explained by the notch (a) Figure 14 filled with fibrous tissue. A section through this space would show a break in the continuity of the bone. The notch becomes deeper as we proceed toward the inner wall of the tympanum.

In these sagittal sections the capsular ligament of the malleo-incudal joint is thicker in the lower part while in horizontal sections it is more conspicuous on the inner side except near the

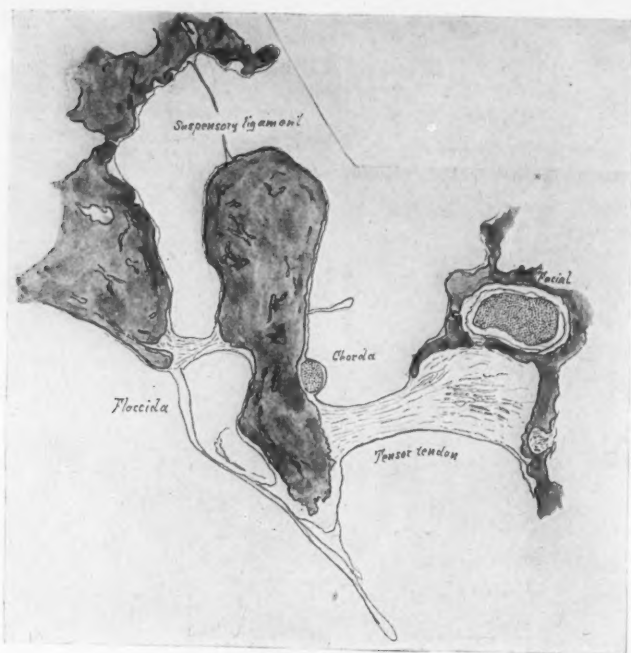


Figure 10.



Figure 11.

upper periphery of the articulation where it is reinforced on the outer side by a stout band of fibrous tissue, Figure 17.

While many writers have denied the presence of a meniscus in the malleo-incudal joint, the writer has usually found it represented by a distinct disc of fibro-cartilage whose shape and size varies with the direction and level of the section. In central horizontal sections it is usually wedge-shaped with the thick end internal while in the upper part of the articulation it has ap-

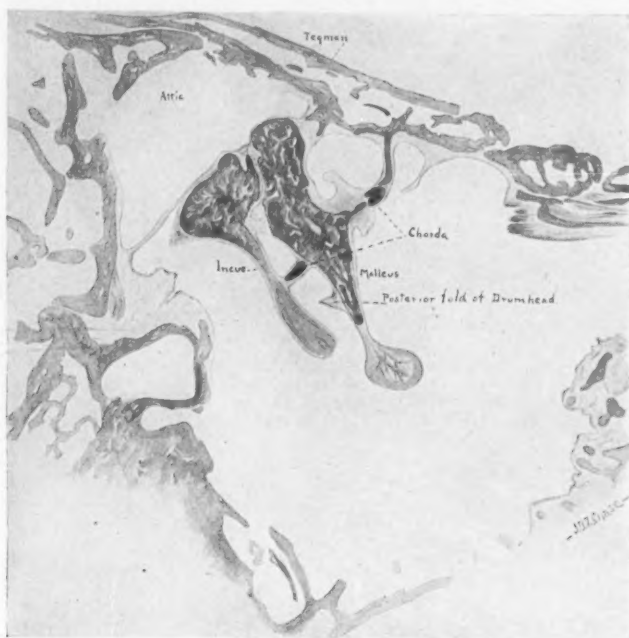


Figure 12. Outermost sagittal section showing the relation of the chorda to the malleus and the incus and the attachment of the posterior fold of the tympanic membrane.

proximately the same width throughout. In one specimen we found a dumb-bell-shaped meniscus in the central sections. In sagittal sections it usually is clearly defined at one or both ends of the joint and in some cuts is quite conspicuous near the center.

Cartilage usually sheathes the posterior tip of the short process of the incus, the short process of the malleus, the outer, posterior and to a less extent, the anterior surface of the malleus-



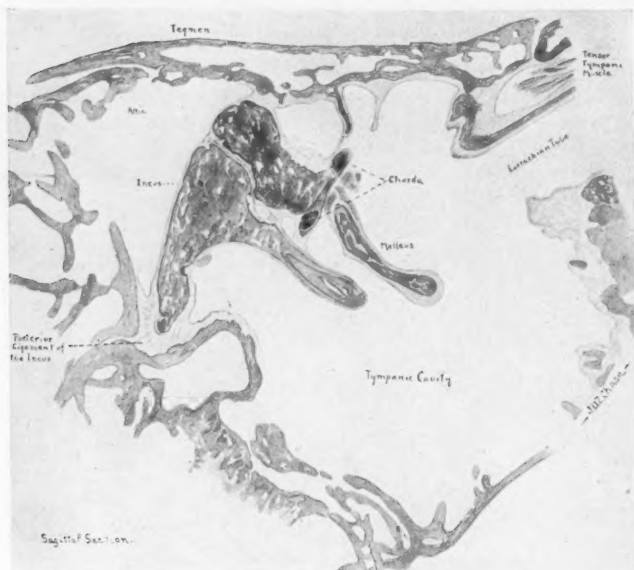


Figure 13. Central section showing the relation of the chorda to the malleus and the incus, the tensor tympani muscle to the Eustachian tube, and the tegmen tympani to the malleus and incus.

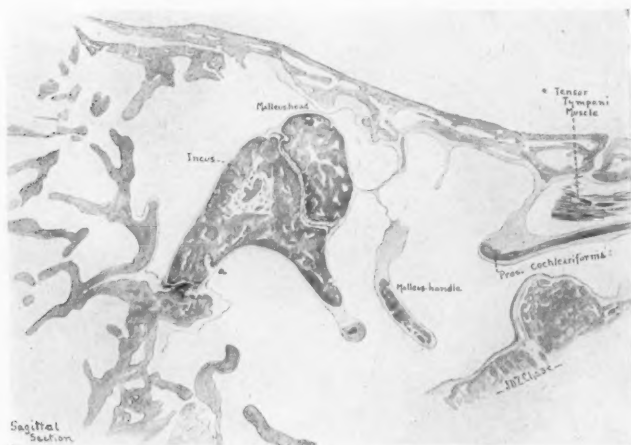


Figure 14. Internal to the central section, showing a notch (a) in the short process of the incus, the processus cochleariformis separating the tensor tympani muscle from the Eustachian tube.

handle, although such a well-defined cartilaginous sheath of the handle as described by Gruber has not been seen.

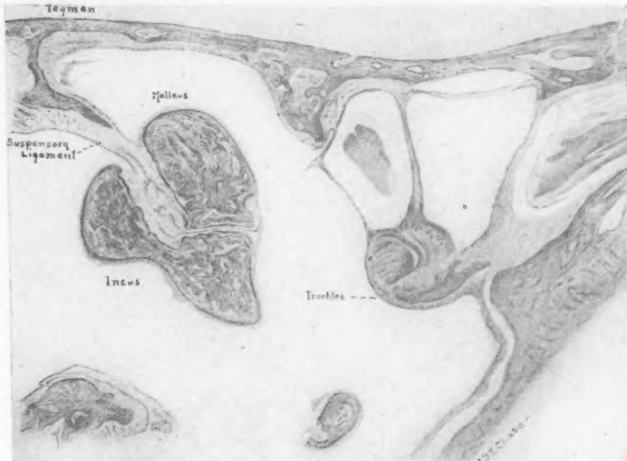


Figure 15. Innermost of the sagittal sections showing a broad suspensory ligament extending from the tegmen to the malleo-incudal articulation and containing a plate of bone. Bands of fibrous tissue from the tegmen to the trochlea.

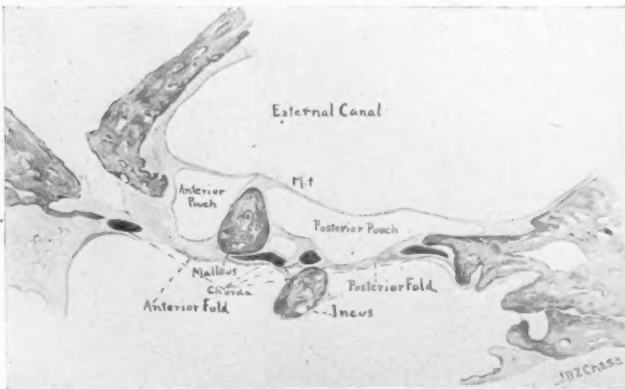


Figure 16. Horizontal section showing the relation of the anterior and posterior pouches to the drum-head, anterior and posterior folds, chorda, malleus, incus and adjacent walls.

In the horizontal section, Figure 16, are shown the anterior and posterior pouches separated by the manubrium and bounded externally by the drumhead and internally by the anterior and posterior folds including the chorda, cut in several places.

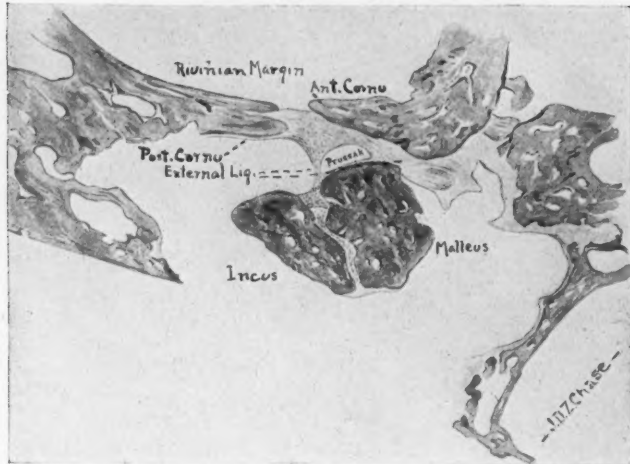


Figure 17. Horizontal section. Re-inforced external ligament of the malleo-incudal joint, the meniscus, the upper part of Prussack's space, and the external ligaments of the malleus.

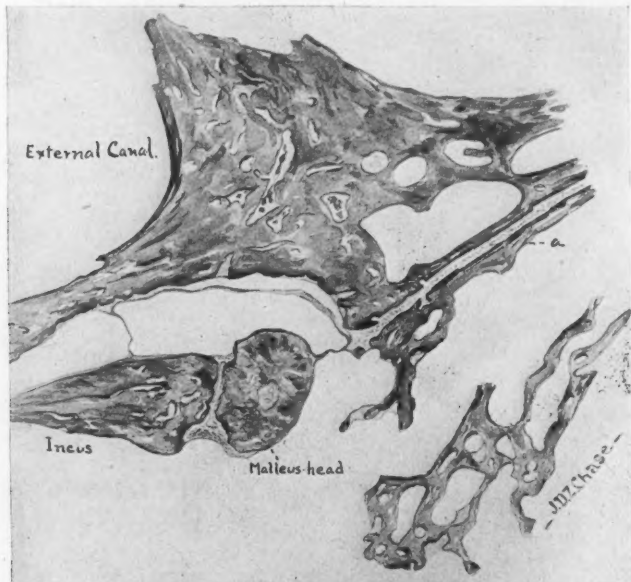


Figure 18. Horizontal section. An unusual specimen showing the relation of the petro-squamosal suture to the malleus head. Note the reinforcement of the inner side of the capsular ligament of the malleo-incudal joint.

The horizontal section, Figure 19, shows a well-formed joint between the posterior end of the short process of the incus and the tympanic wall instead of the usual fan-shaped ligament shown in both the horizontal and sagittal sections here pre-



Figure 19. Horizontal section. A joint between the posterior end of the short process of the incus and the tympanic wall instead of the usual fan-shaped ligament.

sented. A similar anomaly from a photograph of preparation by Dr. Blake is illustrated in Randall and Morse's "Photographic illustrations."

More curious and probably unique is the horizontal section, Figure 20. It depicts a psuedo-articulation between the outer

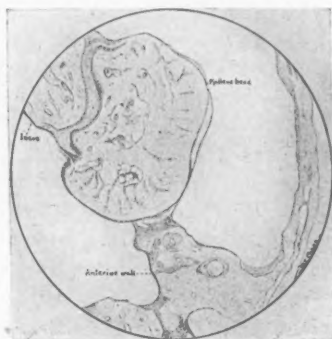


Figure 20. Horizontal section. A pseudo-articulation between the outer part of the malleus head and the bony projection of the anterior tympanic wall.

part of the malleus-head and a broad, bony projection of the anterior tympanic wall.

The long, sharply defined space filled with fibrous tissue at (a) in Figure 18 is probably the petro-squamosal suture.

1926 Chestnut Street.

## VACCINE THERAPY IN EAR DISEASE. FURTHER CONTRIBUTION TO THE STUDY OF THE SUBJECT.\*

DR. VIRGINIUS DABNEY, Washington, D. C.

Stengel comments on the slow acceptance of diphtheria antitoxin by the profession at large despite the exhaustive study and scientific clinical demonstration, as contrasted with the eagerness and indiscriminating favor with which all sorts of vaccines and serums are now employed. This haphazard zeal has not been restrained by the natural check of ill effects, as there are practically never any, though Stengel is not willing to admit this. I have never seen a case where the use of vaccines could have been instrumental in any untoward result existing after their use.

The unthinking use of mixed vaccines and stock preparations, generally reflects no credit on the attendant, usually results in no benefit to the patient, and frequently does harm to a legitimate therapy which has a field of value restricted though it be. A suppurating ear with necrotic bone as a base is manifestly an improper field for this treatment, though it is so employed frequently, either through ignorance of the merest fundamentals of pathology, or lack of a proper interest in the study of the case. The inevitable failure should bring discredit upon the otologist,\* not upon the therapy.

On the other hand, the opsonic index with its complicated technic and the dreaded negative phase deterred many from using vaccines, whereas we now know that it is safe to ignore them both, watching vigilantly instead the clinical signs and symptoms as a sufficient guide. In this opinion I find myself in accord with Holden, who thinks that over the whole field of medicine failures are more frequent than successes. In ear disease this is not true, as thoughtful otologists do not use vaccines in every suppurative otitic disorder, nor as the only therapeutic measure. Vaccine therapy is distinctly and only an additional measure, and never to be undertaken to the exclusion of any and all the usual precautions. Moreover, even with this reservation, success depends much on the culturing, preparation of the vaccine and its method of administration; thus creating a wide margin of error, and, by the

\*Presented at the nineteenth annual meeting of the American Academy of Ophthalmology and Oto-laryngology, Boston, October 20, 1914.

same token, of failure to benefit. While I do not wish to enter upon the bacteriologic technic I will add the final touch by saying that a vaccine is a delicate substance and one easily destroyed by a few degrees of heat in excess of that required to secure sterilization. A laudable zeal to attain this essential leads at times, I am sure, to a sterile vaccine, it is true, but also to an inert preparation. Thus again we see another cause of failure.

In chronic suppurative processes of the ear it is not always easy to secure the causative organism, largely due to reinfection on top of the basic trouble and the attachment of saprophytes to the decayed material. For this reason repeated reculturing both before and during treatment is necessary if we are to be sure of our bacteriologic diagnosis. Acute suppurative otitis media generally clears up so readily under the ordinary cleansing treatment that the temptation is strong to omit vaccines from the therapeutic armamentarium, yet the reports of McDonald, Weston and Kolmer, Conners, Christie, Jacobs and Dabney show that their use was of assistance in the cure of three times as many acute cases in thirty days as was experienced without this aid. Moreover, they were the product of the more virulent infections, such as scarlatina, influenza, typhoid fever, and diphtheria. Three years ago I used vaccines extensively in acute otorrhea, but I have since then modified my use to this extent, that I omit children of a neurotic strain, and wait for five to seven days before starting the treatment. This latter precaution allows the discharge to give some intimation of its virulency, and, consequently, necessity for vaccine. Moreover, it is known that a vaccine acts better after this pause than if given earlier before nature has well organized its phagocytic defense. Thus, it sometimes becomes apparent that the disease will yield without the use of vaccine. Where it is at all possible to get it, the autogenous preparation should always be employed; this has been firmly established not only as a scientific measure but on grounds of efficiency. (Wolfsohn, Kreuscher, Wright, Pearce, Dabney and many others.) The use of a stock preparation (save in one apparent exception to be noted later in my own work) is a leap in the dark and unscientific in the extreme.

The following are the organisms from which I have vaccines prepared, and experience has demonstrated to me that it is useless to experiment with other organisms, a lesson I have learnt only after much onerous research. The doses are based on the adult, to be reduced proportionately for the young: *Staphylococcus pyogenes aureus* and *albus* 250 million. *Streptococcus pyogenes* 25 million.

Bacillus of proteus type 30 million. Bacillus pseudodiphtheriae 40 million.

Injections are to be repeated every three or four days, and increased one-third, depending on the reaction and the progress of the disease. Nephritis, diabetes, tuberculosis and severe constitutional depletion are contra-indications. It is always wise to give an additional dose after apparent recovery, as it tends to prevent a relapse. Failure on the part of the patient to submit to this precautionary measure has caused just this set-back in my practice several times.

In a paper some three years ago I invited attention to one of the incidental effects of the use of vaccines, namely: the metabolic improvement and bettered physique. Similarly Bruce noted in patients afflicted with chronic mania, in whom lack of nutrition so often is a prominent symptom, that the use of autogenous vaccines was nearly always followed by increase in weight and improved metabolism. This same corrective influence is often observed under the administration of vaccines in the course of a stubborn middle-ear discharge, but is not to be accounted for solely by the cessation of the suppurative process (as it does not always cease), since metabolic changes are ordinarily slow after the local lesion ceases to poison. In long suppuration of the middle ear and in stubborn sinuses or unhealed wounds following the various mastoid operations, there is encountered often a septic condition, almost a cachexia, in a patient, whose anemia, depleted vitality, and loss of appetite are familiar to all otologists. The correction of this unnatural state and usually the pus-formation, too, is with the assistance of vaccine the result of one and the same process, which I interpret as an elaboration of the side-chain theory of Ehrlich. In brief, the receptors previously having in health the function of uniting with a food molecule and assimilating it, under diseased conditions unite with a molecule of toxin; thus shutting off that much nutrition from the body. Naturally, when the toxins are numerous, numerous receptors are pre-empted by them, and the metabolism of the body suffers proportionate detriment. Thus in destroying these toxins, the vaccine renders available for food assimilation receptors heretofore occupied with toxin assimilation.

Furunculosis of the auditory canal is an unusually stubborn, painful affection, lasting frequently from ten days to four weeks, but I have seen only one case which lasted as long as a week under vaccine treatment, and required as many as three injections, whereas I have seen a case of two months' duration cured after two injec-



tions. With this exception, all my cases have cleared up in less than six days and with only two injections. Consequently I regard vaccine as a specific for furunculosis of the canal, save where it is caused by diabetes, lues or tuberculosis, of course. The first injection generally relieves the pain in twelve hours, and the swelling is markedly less; the second dries up the discharge, if there is any, and causes all tumefaction to disappear. This result cannot be explained by the increased drainage in those cases which are incised, as incision alone has not so benefited other cases. Moreover, some of them had already ruptured, others had not and did not rupture. Again, we see cases which are flowing freely where all the symptoms continue despite the good drainage. Such confidence have I in the treatment here advocated that I have been able twice to diagnose diabetes from failure on the part of vaccine to help cases of furunculosis, though the internist who referred the case had no reason to suspect the glycosuria, nor had I till the injections failed to benefit. The following case should convince the most doubting of Thomases:

*Case 1.* J. D., a boy of 4 years of age, had been suffering for several days with earache and swollen face; when seen June 11, right canal was so tightly closed as to admit probe only with the use of considerable force. The whole right face was swollen, red and brawny; the lower eyelid edematous and the eye nearly closed. Temperature 100° F. Canal incised, half dram of pus escaped; 100 millions stock staphylococcus vaccine injected. Next day, June 12, a little more pus squeezed out; eyelid and eye practically normal; brawny area gone save pretragal gland; no pain; canal patulous, permitting view of membrana tympani which was normal. The patient felt so well that he did not return for six days, contrary to my orders; drop of pus wiped out of sinus; 150 millions stock vaccine injected. Had he received this three days earlier according to routine there would have been no pus and no sinus left. June 22, he was still well; no relapse. Case healed and well in all respects June 20. The culture showed pure staphylococcus aureus, and stock vaccine was given, as it takes from four to five days for the culture and the preparation, and the cases all yield as a rule before this time. However, the stock is not the ordinary commercial article by any means, but is prepared in the laboratory of the United States Army Medical School, and is drawn from seventeen strains of unusual virulence. This is only an apparent exception to the rigid rule to use autogenous vaccine, and is to be classed as one of the times when it was impossible to

secure it. Instead of giving other clinical argument, I will say that I have seen a case of six weeks' standing clear up in a week with two injections and without any other treatment whatsoever but with the before-mentioned improvement in physique and color.

Where there is caries of any part of the auditory tract, vaccines can effect no permanent good. Where the discharge originates from the soft parts, their use can be of service, if the causative organism is isolated and secured. Herein is briefly stated the province and limitation of vaccine therapy in chronic suppurative otitis media, and in sinuses following operation on the mastoid, (Dabney). The granulating surfaces left in the latter class of cases seem prone to become sluggish and at times the cause seems to lie in re-infection or in a lowered resistance to that infection which has always existed.

*Case 2.* M. E. H., a child of 6 years of age, had been operated for acute mastoiditis and four months later the wound had been curretted because of failure to close. Seven weeks after this currettement she was brought to me, when the wound was observed to be two inches deep, three-quarters of an inch in diameter, and cone-shaped. An autogenous vaccine prepared from the culture of bacillus pseudo-diphtheriae, 10 millions, was given. After two injections, the granulations which had been pale, flat and glazed, not bleeding on manipulation, became raised into papillae, bright-red and easily made to bleed at the slightest touch. After an interval of six days an injection of 30 millions was made, and the wound was found to be one-half inch less deep; after another pause of ten days, 40 millions. Here we had to suspend vaccines, as the child had become highly intolerant of the pain caused by the needle. However, the impetus given the healing process was sufficient to close in five weeks a wound that had not healed in five months, and had shown no evidences of the reparative process for two months before the use of vaccines.

*Case 3.* E. D. M., woman of 23 years of age; radical mastoid done four and a half years ago, never dry though narrowed to a two-limbed sinus for past two and a half years. Facial neuralgia practically continuous for three years. Pale, sallow, neurotic, verging on melancholia; 10 pounds underweight.

On removing the cholesteatomatous deposit a pure culture of staphylococcus albus was obtained, and autogenous vaccine was given at intervals of a week, and later two and three weeks, the dose beginning at 250 millions and carried up to 800. Treatment covered the time from October 15, 1911, to December 22, with

complete cessation of the discharge and firm healing, though the scar broke down on May 4, 1913, and July 1, 1914, only to heal under cleansing with peroxid and argyrol in a week. The neuralgia disappeared in first four weeks, returned twice a year later, but on drawing two carious wisdom teeth permanently disappeared. Patient became a totally different person, cheerful, gained 10 pounds in weight, has had no trouble save an occasional collection of hard wax mixed with detritus which requires only one treatment for its relief. The only internal treatment given was phosphatic emulsion of cod liver oil, which I employ in all mastoid cases that show any tendency to prolonged convalescence or caries.

Labouré reports a similar case, in which vaccine assisted the convalescence after a radical operation for the cure of an otorrhea of twenty years' standing. The operation alone did not accomplish the desired end till vaccines were employed.

*Case 4.* H. M., woman, aged 24; good general condition; bilateral suppurative otitis media for two months; similar attacks every winter for several years; never so severe pain or so profuse discharge as now. Very deaf, and mastoid quite sensitive on pressure over antrum; long polyp removed from left canal which it completely filled, attached to drum; 250 millions autogenous staphylococcus aureus given. Discharge ceased in eight days; second precautionary dose on eighth day; no return; deafness relieved by six inflations of tube.

*Case 5.* Exhibits the result of omitting the precautionary dose: V. T. T., female, 32 years of age, acute running ear for two weeks; 250 millions autogenous staphylococcus albus vaccine given and discharge ceased in ten days. Two weeks later, discharge returned as patient received but one dose. A second dose of 350 millions resulted in a cure in four days. The deafness, almost absolute in the affected ear, was relieved by the routine inflation.

Some of the cases given herein to strengthen my contentions have been reported in another paper, and some of the text is of necessity a quotation from it. The accompanying table needs no explanation, but is given as the most concise manner of summing up the results, which, after all, are like wisdom, "the principal thing." While I have given somewhat in detail only the successful cases, as the unsuccessful ones require only a record of failure, the table will show signal failures in abundance. In commending this therapy, let me repeat that I have no illusions on the subject, and that there is no royal road to health for afflicted ears, nor should

it be used without all the other means of treatment commonly employed by the experienced. Every case I have ever handled has been given the most searching routine treatment known to us all as of benefit, and I have not so stated in each case, as it was deemed unnecessary.

Author	Disease	Number	Cured	Improved	No change	
McDonald	subac. O. M. P.	13	13			
	chr. "	17	3	5	9	
Weston & Kolmer	subac. O. M. P.	100	83	10	7	
Patterson et al.	" "	10	7	0	3	
	chr. "	17	3	3	11	
Connors	subac. "	7	2	3	2	
Christie	" "	6	6			
Jacobs	chr. "	6	2	4		
Thomas	" "	1	0	0	1	
Hoobler	" "	2	2			
	mastoiditis	1	1			
Beck	chr. O. M. P.	7	0	7		
Scott	mastoiditis	1	1			
Sill	subac. O. M. P.	124	70	22	5	(3 operated for mastoiditis; 23 disappeared)
Dabney	Furunculosis	36	36			
	chr. O. M. P.	22	7	5	10	(2 diabetics)
	subac. O. M. P.	23	18	0	5	
	mastoid sinus	15	9	4	2	" "

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## TUBERCULOSIS OF THE PAROTID GLAND.\*

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This paper discusses a somewhat rare condition, apparently especially rare in this country, as only four cases have been reported, while only eleven cases have been reported abroad, as far as my knowledge goes.

For our knowledge of the pathology of this condition, we owe much to the French, German and Italian authors, while as to etiology, the most complete work has been done by George B. Wood, in this country, and Nadel and Pouget in Europe.

The first case to be reported was that of De Paoli, 1893. Since that time, cases have been reported by Von Stubenrach, Legueu and Marien, Bockhorn, Meselay, Lecene, Kuttner, Parent, Frank and others. Fiorvanti refused to add a case of Danielson's because the parotid lymph glands as well as the salivary were involved. This does not seem to be a proper view to take, with our present knowledge of tuberculosis and infection in general, as we do not know how many apparently healthy individuals are affected with tuberculosis or how infection has taken place.

The avenues of infection are probably the same whether the gland is involved primarily or secondarily. In secondary involvement it may be said that the vitality of the gland is lowered through lack of proper nutrition, and the saliva changes to such an extent as not to promote proper oral digestion; thus giving a vicious circle.

Lockard quotes V. Harris as stating that he found a lack of ptyalin in the saliva of tuberculosis patients, and, obtaining the glands post-mortem, found them affected by fibrosis. This would coincide with the above statement. He examined the sub-maxillary and parotid glands.

Before going into the controversy over etiology it might be well to give a few extracts of case reports. Most cases are primary or at least believed to be so at the time of reporting.

The first case of De Paoli's, a male, age 33, without previous personal or hereditary history, presented himself with a swelling of the left parotid about the size of a hen's egg, which had grown to this size in six months. The patient further presented a facial

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paralysis on the affected side. A diagnosis of sarcoma was made, and the tumor removed. Examination proved it to be tuberculosis. He does not venture an opinion as to how the infection had taken place.

In 1894, von Stubenrach reported a case which presented some different characteristics. A male, aged 60, who had suffered from stomatitis and accompanying salivation, presented with a small fluctuating mass in the right parotid region, which was very painful. Pathological examination: a large, psuedo-cyst, with liquid contents similar to saliva, and with a wall about 2 cm. thick which presented internally tuberculous granulations, while external to these the capsule consisted of fibrous, connective tissue, with the remains of excretory canals, and of degenerated glandular elements, atrophied and altered in various ways. These changes and tubercles which were mostly situated around the excretory ducts led von Stubenrach to believe that infection took place through Stenson's duct.

In 1895, another case was reported by De Paoli. The patient was a girl of 19, whose left parotid was involved, and in spite of his previous experience he made a diagnosis of fibro-sarcoma. Pathological examination after removal proved it to be tuberculous. This can be explained again by the fact that there was no personal or hereditary history of tuberculosis.

In the same year Leguen and Marien reported the case of a girl of 13 years, in whom there had formed during a long period a swelling as large as a nut covered with skin, and apparently adherent to the left parotid gland. A diagnosis of adenitis was made but examination disclosed many tubercles diffused in the parenchyma of the gland, and a central softened mass.

The case Bockhorn reported in 1897, was that of a lady, 39 years old, with no previous history of tuberculosis. There was found a swelling of soft consistency, which had formed in a period of three months in the left parotid region. It was diagnosed clinically, as a syphilitic gumma. Pathologically it was recognized as tuberculosis of probable vascular origin on account of the greater abundance of tubercles in the region of the vessels.

In 1897, Kiesow reported a case in a girl of 13 years. Parents and sisters well. Swelling in both cheeks, began three years ago, and has gradually enlarged. Not painful. Patient small, undersized and stupid. In the neighborhood of both tempomandibular joints, swellings the size of a pigeon's egg, giving the appearance of mumps. Right sharply circumscribed tumor, while the left showed a large tumor, extending into smaller



growth above and into parotid gland; not sharply circumscribed. Fairly hard. Lungs, heart, mouth and pharynx normal. No enlarged lymph glands. Diagnosis: bilateral sarcoma. Histological examination, early form of tuberculosis.

In 1898, Meselay and Parent reported the case of a man of 61 years, family history negative, who had suffered previously from a right otitis and from dental caries. He gave a history of having noticed for three months a swelling in the region of the left parotid gland, hard and irregular, painful for last month. The clinical character of the swelling and its evolution seemed to the authors to be that of a mixed tumor of the parotid. Partial enucleation of parotid with temporary facial paralysis. The pathological examination showed the characteristics of tuberculosis, probably of hematogenous origin, because as in the case of Bockhorn, the greater entity and diffusion of the tubercles, corresponded to the vessels. Recovery with complete healing.

Lecene, in 1900, reported having seen a young man of 29 years, whose sister had died of pulmonary tuberculosis. A mixed tumor of the right parotid was diagnosed and removed. Examination of the section showed tubercle of hematogenous origin. Tuberculous granulation tissue and tubercle bacilli without caseation.

Mintz, in 1900, reports the case of a child of 3 years with a lesion in the left parotid which, on pathological examination, proved to be tuberculosis of the gland. He found all stages of inflammation and caseation.

Kuttner, in 1900, records a case in a male of 18 years. Family and personal history negative. Fluctuating swelling in left parotid, with pus discharging through duct. Two operations followed by temporary facial paralysis with recovery.

Scheib, in 1900, reported a case of a girl of 15, who for four weeks had a swelling in right cheek, painful at night for last fourteen days. Cough without expectoration, loss of appetite and night sweats, temperature 38.1°. Opening of Stenson's duct shows a red protuberance, the size of a small pea. Tumor softened in the middle, and on opening, pus found containing tubercle bacilli. Died one month later of pulmonary tuberculosis. Author believed it to be hematogenous infection, as blood vessels in region of abscess were found thrombosed on post-mortem examination.

Faure-Darmet's case in 1901 was that of a man, aged 42, who presented three swellings which later broke down and discharged

through these fistulous openings. Guinea pigs were inoculated and found to have tuberculosis when killed, but the author admits there may have been errors. The case was diagnosed as cutaneous actinomycosis. Lungs normal. Operated by curetting. Illustration of case resembles author's except that it is a unilateral involvement.

All cases reported by American authors have occurred since 1900. The first was reported by Frank in 1902, and was found in a male child of only 22 months. When seen by Frank it was a swollen mass in the right parotid, which had been opened six weeks previously and refused to heal. Examination showed it to be tuberculosis of the parotid.



Figure 1. Author's case. Left Parotid.

Scudder recorded a case in 1902. Family history negative. Personal history, always well; married twenty-six years; has three children. Present illness: five years ago a small swelling appeared just below the lobule of the right ear. Three years it grew slowly, for over a year it increased perceptibly, but painlessly. She has had no subjective symptoms. Her hearing is good. There have been no pressure disturbances.

Physical examination: A large, fleshy, well-developed woman. In front of and below the right ear is a broad spherical swelling, about two inches in diameter. It is hard and rounded, with irregular, indurated borders. It is slightly movable upon the parts beneath. It is not attached to the skin, nor is it tender to palpitation. The chest is negative.

Operation: Mass removed through a curved incision. Capsule adherent closely to the surrounding parts. Upper part of the neck carefully dissected. Stenson's duct and facial nerve

divided, as they were involved in the disease. A few small glands were removed near the tumor. The wound healed quickly. She left the hospital one week after operation. A year and one-half following the operation examination finds no recurrence at the seat of the original disease. The cicatrix is soft and unattached to the parts underneath. There is a right facial paralysis. Pathological report: A fragmentary tumor from the parotid region. Microscopic examination showed parotid gland structure in which were numerous small foci composed of epitheloid, small, round and numerous giant cells, with cheesy degenerations: Tuberculosis.

In 1903, George B. Wood reported the case of a man, age not given, who presented a tumor-mass one and one-half inches across, in the parotid region, which proved on examination to be tuberculosis. Wood believed that infection took place in this case through the tonsil to the parotid lymph glands and then to the salivary gland.

Borchardt in 1903 states that a woman, 51 years old, presented with a swelling in front of the right ear. Parents healthy, but three sisters died of tuberculosis, and daughter operated for "glands" one year ago. Patient always healthy. Heart and lungs normal. Swelling present for thirty-five years but never painful. Now the size of half an orange, seems to consist of several lobes and of uniform consistency. Histological examination showed tubercles in salivary and lymphatic glands, but no areas of caseation. Considered lymphatic infection either from the ear, teeth or gums. Teeth and opening of Stenson's duct not examined.

In 1904, Cole reported the case of a colored male who gave a history of lues eight years previous and from whom tuberculous cervical glands had been removed five years previously. There had also been an attack of pleurisy only nine weeks before presentation of patient. Examination: left parotid region presents tumor size of a walnut, while right presents one the size of hickory nut. As case had not been operated when report was made, pathological report could not be given, so there is a question of doubt.

In a recent letter from Dr. Cole, he adds the following: The patient left the hospital to return for operation, but never came back and nothing further was heard of him. The guinea pig inoculated with the pus aspirated from the glands developed tuberculosis. It is therefore impossible to state whether or no

the tuberculosis primarily involved the parotid or simply the lymphatic tissue, which, as is known, is present in this region.

In 1905, Puppel reported two cases, one, a girl of 15, very pale and ill nourished, who was operated on for tumor in the parotid, which proved to be tuberculous. Patient developed general tuberculosis three weeks later. The second was a young man of 26. His mother died of pulmonary tuberculosis some years before. Father suffering from pulmonary tuberculosis. Sister well. Patient operated two years ago for tuberculosis of the right hand, and had swelling of the right ankle immediately after. At present has fistula and suffering from night sweats. He is of middle size, pale but well nourished. Chicken breasted. No cough or expectoration. Heart normal. Marked swelling, hard but not



Figure 2. Author's case. Right parotid which became swollen six weeks after left.

painful, in the right parotid region. Removed and glands curetted. Wound healed in two months, with slight paralysis of facial nerve. Numerous tubercles in parotid tissue. Histological diagnosis: chronic tuberculosis.

Danielson's case reported in 1907, was that of a peasant 26 years of age. No family or personal history given. For two months he has noticed a painless swelling in right cheek, which has gradually increased until it touches the lobe of the ear. Histologically the gland is involved, so that no normal tissue can be found.

In 1910, Fioravanti, after reviewing a number of cases, reports the case of a woman, age 34, of whom he says: "She has nothing noteworthy in her personal or family history; has always led a busy life and has been very well. She often suffered from tooth-

ache, however, and recently had to undergo extraction of a right decayed molar. (He does not say whether upper or lower, or whether first, second or third, which is quite important, as relating to the opening of Stenson's duct.) About a year ago she noticed a swelling, about as large as a small nut, in the right parotid region, which kept on increasing in size until it reached the dimensions of a pigeon's egg, but did not cause any painful sensations either spontaneous or upon pressure. The doctor, whom the patient consulted, advised a surgical operation, to which she consented. This consisted in an incision, from which issued a moderate amount of serous fluid, opalescent and very similar to saliva, so that the operator suspected it was a salivary cyst. Escape of the fluid did not cause the complete disappearance of the tumor, which, though greatly reduced in dimensions, remained evident and stationary up to six months, when it began to grow again, rapidly reaching the size of a hen's egg, and causing difficulty and pain in the mastication of food. It seems the patient did not have any fever. Frightened by the recurrence of the tumor, by its rapid growth, and the disturbance produced by it, she decided to submit to another operation and therefore entered the hospital.

Post-operative history was normal. After thirty days the patient was discharged cured, excepting that there was a persistent paresis of the facial, which existed before the operation.

Pathological examination: Examination of the tumor presents the dimensions of a hen's egg and seems incompletely closed by a capsule of thick connective tissue of a rosy gray color. Surface not smooth, but irregular and contorted. A section through its entire substance reveals that the central part is composed of a focus of degeneration, with ragged walls and containing a small quantity of very thick pus. In the interior are seen extensive zones of caseous aspect alternating with fibrous zones of reddish gray color. On some points in the peripheral portions, one can recognize the glandular structure with the characteristic lobular arrangement, although even here there are occasional small foci of softening and caseation.

Nadel and Pouget, in 1911, report the case of a male of 50 years of age, baker, with a small tumor in the right cheek, a little in front of the parotid. Two sisters died of tuberculosis, one sister living and well at 60. Nothing of interest, except lobar pneumonia at 45 and syphilis at 46. Number of injuries, especially burns. Six months ago had pain in region of the last two upper

molar teeth, ending with abscess in cheek which opened externally, but yielded to treatment in fifteen days. Three and one-half months later pain returned and patient noticed development of tumor at sight of fistula, which has grown in two and one-half months to the size of a small nut, adherent to the parotid gland. Patient of splendid physique, florid countenance, strength normal, respiratory apparatus normal, no cough. Heart normal, urine abundant and normal. Tumor removed, and an examination found it to be tubercular.

They also report the case of a woman, 74 years, with tumor in right parotid which had been present for two months, but for the last eight days growth had been very rapid and now presents a softened area of violet-rose color, at height of lobule of ear and anterior border of masseter and of the size of a hazel nut. Mother died of tuberculosis at 45. Patient was sent to country at 13 because of weakened condition, although not coughing. Had rheumatism at 20, of which traces still remain. Examination of chest negative. Only teeth present were two posterior lower molars. Opening of Stenson's duct normal. Diagnosed as cyst or suppurating gland. Histological examination showed tumor to be one enormous tuberculoma involving salivary gland tissue.

Author's case: Patient, National Jewish Hospital for consumptives, H. A., male, age 24, born in Russia. Family history negative. Personal history: Well until two years ago when he contracted pulmonary tuberculosis. One hemorrhage one and one-half years ago, but none since. Condition at present time very good. Weight 148 pounds, which is about normal for height of five feet ten inches. Sputum: muco-purulent, few bacilli, pus cells, staphylococci. Diagnosis: Chronic catarrhal tuberculosis.

Present trouble began June 15. First examined by interne June 20: Swelling of left parotid gland. June 22, temperature 100°, pulse 124. Swelling increased. June 23, first seen by author.

Examination: Teeth normal, except upper left first molar, also right second molar absent, filling in distal of first molar; mucous membrane of the mouth normal, except a slight swelling and redness around orifice of Stenson's duct upon left side; nose, pharynx and larynx normal. Very slight redness of the left membrana tympani and swelling on anterior wall of cartilaginous portion of canal. Hard swelling of the left parotid gland,



simulating an attack of parotitis. As no history of a previous attack could be elicited, it was so diagnosed in face of the fact that the patient admitted at this time that he had received a blow from the fist of another patient in an altercation a few days previous.

June 27, some softening. June 28, using ethyl chlorid spray, opening was made beneath the angle of the jaw, cutting through the skin only, further separation of tissues being completed with forceps, evacuating about one and one-half ounces. Rubber drainage tubes introduced. Examination of pus showed only diplococci present. Discharge of pus mixed with salivary secretions continued.

July 25: In dressing, interne opened another abscess which apparently was walled off from the original cavity by an intervening gland septum.

August 2: Temperature 100°, pulse 110. Under chloroform anesthesia the cavity was curetted, bringing away a large amount of gland tissue. Microscopical examination of this tissue showed large numbers of tubercle bacilli, but no diplococci.

August 4: Rapid swelling of the right parotid. This had been anticipated as the patient had complained of pain in this region for three or four days previous. August 8: Temperature 100°, pulse 110. Under chloroform anesthesia, abscess was opened under angle of jaw. Pus showed not only diplococci, but tubercle bacilli present in large numbers. Pus and saliva continued to discharge from the wound. Bacteriologist at sanitarium reported the diplococci found to be identical with the organism of parotitis. Smears directly from pus showed diplococcus five-tenth to one and a half microns in diameter, intracellular and extra-cellular; gram positive, no capsule; no development in ordinary media but abundant growth on mixed sterilized saliva, with glycerin agar agar; stopped propagating at 38 degrees C.

September 10: Right still shows discharge of pus and saliva, while left only discharges saliva through fistula. November 8: Right healed. Left salivary fistula, after which patient was not well, although he lived for two years, finally succumbing to pulmonary tuberculosis.

One very interesting point in this case is that we had no facial paralysis on the left side, although nearly the whole parotid gland sloughed. The connective tissue septa and nerve trunk

probably resisted infection. Infection in the left or first gland affected may have been either hematogenous, or canalicular in origin with properties of the latter, while the right was undoubtedly canalicular, i. e., through Stenson's duct. The right side showed some dropping of the eyelid, which recovered.

Although tuberculosis of the parotid gland is rare, it must divide honors with the sub-maxillary, only four cases of which have been reported.

Aieroli in 1895, Zoux in 1897, Arcoles in 1900, and Gilmer in 1902. Zoux did not make a histological or bacteriological examination, and therefore his case is open to question.

As oral tuberculosis is rare, there must be some reason, for the oral cavity is probably exposed to infection more frequently than any other region of the body, in fact almost as much as the skin, which is infrequently affected.

It may be due to the protection given by the stratified squamous epithelium, that the oral cavity and skin escape. We know that epithelium is not affected by the tubercle bacillus, but whether the bacillus is rendered inert, for the time being, by passage through these cells and must lodge in a lymph gland to regain its virulence, is a question.

From the standpoint of oral sepsis, or what we might call oral transmission, the work of Gilberti is, to say the least, interesting.

To determine how far tubercular infection can affect via the oral mucous membrane, he removed the cervical and inguinal lymph glands of thirty children who had died of various diseases, but known to be tuberculosis. Each of the glands were macerated separately and injected into two sets of guinea pigs, all of which had been subjected to the tuberculin test, with the following results: Of those injected with the cervical extract, thirty in all, eleven died of tuberculosis, seventeen died of other causes inside of one month, and two killed after three months showed no signs. Those injected with inguinal gland extract, showed the following results: Two died of tuberculosis, five of intermittent troubles, and twenty-three showed no sign of tuberculosis.

In concluding the author propounds the following queries: 1. Is there an anatomic path from the mucosa of the mouth to the glands and right heart? 2. If every bacillus passes through the lungs, why is not pulmonary tuberculosis more common in infancy than it is as compared with other tuberculous localizations?

There seem to be two distinct types of parotid tubercle: 1. The chronic or fibroid type which is encapsulated and may not produce symptoms for months or even years. 2. The acute inflammatory type which is diffuse and runs its course in a few days or a few weeks.

The recognized avenues of infection are hematogenous, lymphatic and canalicular. Lymphatic infection and hematogenous infection are hard to differentiate on account of the interlacing of the vessels, a point mentioned by Nadel and Pouget.

Hematogenous infection may take place from any primary focus or through wounded oral mucosa. Lymphatic most frequently through the tonsil although infection around the third molars, draining as these lymphatics do into the glands at the angle of the jaw following retrograde stream, may infect the parotid lymphatic glands, and involve the salivary gland. This happens in case of epithelioma of the tongue, or mandible, so why not in tuberculosis?

Infection through the lymph streams may occur from the external auditory canal, in case of a tuberculous ear, which occurred in De Paoli's first case, but considering the frequency of aural tuberculosis, why is the parotid not more frequently affected? The lymphatics from the external two-thirds of the eyelids and from the upper part of the nose also pass into the parotid lymph nodes, but these parts are very rarely affected with tuberculosis. Furthermore the posterior buccal lymph vessels pass to the parotid lymph nodes and penetrate the muscle in the region through which Stenson's duct perforates.

Canalicular seems to the author the most probable avenue, as it probable is in parotitis. It is not necessary that infection of the papilla at the opening of duct takes place. One of the author's cases of tubercular abscess of the cheek which ulcerated through the duct and discharged caseous masses and serum into the mouth caused no infection of the papilla.

Pinoy's experiments, as quoted by Puppel, of infection of the gland experimentally by injection of bacilli into carotid and into parenchyma as well as by introduction into duct after paralysis of the secretory nerve, would tend to show that infection may take place in any of the three ways.

The prognosis is usually good even in secondary involvement, so far as the local disease is concerned. The diagnosis it seems

is only made histologically and bacteriologically, as in no one of the above cases was a correct clinical diagnosis made.

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**Syphilis of the Esophagus.** UDO J. WILE, *Am. Jour. of Med. Sci.*, August, 1914.

The writer refers to the great susceptibility to syphilitic lesions of the mouth and pharynx, as contrasted with the relative lack of susceptibility to such lesions of the other portions of the digestive tract. The rectum is the sole exception to this rule. He gives a resume of the cases of syphilis of the esophagus from the literature of the subject, and reports a case occurring in his own practice. He believes the condition is not so infrequent as the scanty literature of the subject would indicate.

PACKARD.

## AFFECTIONS OF THE LINGUAL TONSIL AND THEIR TREATMENT.\*

DR. CHARLES C. BIEDERT, Philadelphia.

The so-called lingual tonsil is really not a tonsil at all, but simply a mass or collection of lymphoid tissue at the base of the tongue and in front of the epiglottis. This collection of lymphoid tissue varies greatly in size and shape, oftentimes being nothing more than a rather close aggregation of separate nodes, giving simply a roughened appearance to the base of the tongue. At other times it constitutes rather large masses which may be more or less pendulous.

The lingual tonsil forms the lowest portion of the lymphatic ring in the neck, known as the lymphatic ring of Waldeyer, the other portions of the ring being formed by the two faucial tonsils on either side and the pharyngeal tonsil above. Owing to the situation of the lingual tonsil and the difficulty of inspecting it, it not being seen upon the ordinary examination of the throat, the general practitioner is very likely to overlook affections of this tissue.

For the careful examination of the lingual tonsil it is necessary to use the head-light and the laryngeal mirror. I have frequently seen patients complaining of a sore throat, and upon the ordinary inspection of the throat nothing abnormal could be found, but by using the laryngeal mirror serious disease was found in the lingual tonsil, thus revealing the source of the soreness.

The lingual tonsil is subject to all the inflammations and diseases that attack the other tonsils and tissues of the throat. I have frequently seen the extension of a follicular tonsillitis down to and involving the follicles of the lingual tonsil. We find simple inflammation and hypertrophy, lingual varix, tuberculosis, syphilis and malignant disease of the lingual tonsil; mycosis pharyngeus also frequently involves the lingual tonsil and various benign tumors have been observed. These conditions are all rather rare. I, myself, after rather a large experience in the examination of throats, have only seen one case of carcinoma of the lingual tonsil and probably six or eight cases of syphilis of the lingual tonsil. Syphilis is usually the tertiary manifestation or syphilitic gumma. Lingual varix is of frequent occurrence and often causes a great deal of trouble, producing an irritative cough, which after a time

\*Read at the meeting of the Clinical Society of the Episcopal Hospital, Philadelphia, September 21, 1914.

may cause one of the vessels to rupture, thus producing an alarming hemoptysis. This hard irritating cough of undemonstrable cause which lingual varix produces interferes with the rest of the patient, as a consequence of which he becomes very much run down and loses flesh, so that he and his friends fear tuberculosis of the lungs. I have on more than one occasion been able to demonstrate the source of the hemoptysis as coming from a ruptured vessel of the lingual tonsil and to assure the patient that his lungs were not diseased, and have by the proper treatment reduced the swelling of the lingual tonsil and eradicated the cough, and effected a complete recovery of the patient. Thus, in hemorrhage from the mouth or throat, do not fail to make a careful examination of the lingual tonsil for the source of the bleeding.

Probably one of the most frequent affections of the lingual tonsil is simple hypertrophy, the symptoms of which vary. In some cases we will have a hard, dry, hacking, unproductive cough, especially worse at night or when the patient lies down. This cough may continue for months or years and be the only symptom complained of, as was the case in one patient who came under the writer's notice, a woman, who had a peculiar cough for twenty years by which she was known to all her friends. In this patient the cough was worse whenever she would get in a closed place, such as a theater or in church, and her advent into either of these places usually caused a procession of cough drops and cough lozenges to be passed to her from all directions by well-meaning and sympathizing people, until she finally had to remain away from public gatherings of all kinds. This cough of twenty years' standing was finally cured by the recognition and proper treatment of the cause—a simple hypertrophy of the lingual tonsil.

Cough is usually the predominant symptom in hypertrophy of the lingual tonsil, but in some cases we do not have any cough. The patient will complain of a sense of fullness in the throat or of a sensation of a lump in the throat, which they can neither swallow nor bring up (the so-called globus hystericus). Others complain of a tickling, prickling or burning sensation in the throat. It is surprising to what an extent these symptoms of simple hypertrophy will in some cases of nervous people be carried, as in one case which came to my notice, that of a nervous woman who thought she had some serious trouble with her throat and got herself worked up to a highly nervous state, in which she imagined that she could not swallow and that her throat was gradually closing, that she could not get her breath and that she was gradu-



ally choking to death. These symptoms were all relieved by the recognition of the cause, and by instituting the proper treatment for it.

Mycosis of the lingual tonsil usually occurs in association with mycosis of the pharynx and tonsils. It causes a sensation of fullness, with tickling or prickling sensation in the throat. Upon examination we find the lingual tonsil dotted all over with whitish spots, somewhat raised from the surface and rather adherent, but they can be picked off and if placed under the microscope the diagnosis can be confirmed by finding the *leptothrix buccalis*, the causative fungi, one of the yeast fungi.

To recapitulate, then, we have the following diseases of the lingual tonsil in the order in which we find them most frequently: 1. A simple hypertrophy, causing slight symptoms of fullness and irritation in the throat, with cough. 2. A more or less greater enlargement in which the symptoms may be very pronounced. 3. Lingual varix, in which we have in addition to a hypertrophy of the tonsil, an enlargement and dilatation of the blood vessels coursing over the tonsil. The vessels in some cases have been known to rupture and cause hemorrhage simulating hemorrhage from the lung. 4. The extension of a follicular tonsillitis to the follicles of the lingual tonsil, or in some cases where the faucial tonsils have been removed we often find a follicular lingual tonsillitis in association with a follicular pharyngitis. 5. Mycosis of the lingual tonsil, usually associated with mycosis of the pharynx. 6. Syphilis of the lingual tonsil, usually gumma, although we do not find mucous patches as an extension from the pharynx. 7. Tuberculosis in advanced cases of tuberculosis of the lungs. 8. Malignant disease of the lingual tonsil is very uncommon, and, lastly, we may have any of the benign tumors affecting the lingual tonsil.

*Diagnosis:* The diagnosis of diseased conditions of the lingual tonsil cannot be made without the use of the head-mirror and laryngoscope. By having the patient grasp the tongue and pull it well forward we can then with the laryngoscope make a careful examination and arrive at the diagnosis.

*Treatment:* The treatment of lingual tonsil-conditions is, as a rule, very simple. For the cases of simple hypertrophy, I have found that the application of a glycerole of iodine solution gives the best results. This is composed of iodine, 12 to 16 grains, and iodide of potassium, 24 to 32 grains to the ounce of glycerin. I apply this solution by means of a cotton swab. I have the patient



pull the tongue well forward and am careful not to get any of the solution on the laryngeal side of the epiglottis. The U. S. P. official glycerole of tannin would be my second choice as an application in these conditions. Usually three or four applications of either of these remedies, made at intervals of two days, suffice to relieve the most obstinate cases. If it does not, it may then be necessary to cauterize the lingual tonsil, using tri-chlor-acetic acid, chronic acid, or preferably the galvano-cautery. In using these cauterized agents great care must be exercised to limit the area cauterized to the lingual tonsil. In rare instances it may be necessary to remove a piece of the hypertrophied tonsil with the MacKenzie lingual tonsillotome.

The treatment of lingual varix is pretty much the same as that for simple hypertrophy. If we have one of the vessels bleeding it should be closed by searing it with the electric cautery.

In the treatment of mycosis of the lingual tonsil, I have found that applications of silver nitrate, 60 grains to the ounce, give the best results.

Syphilis, tuberculosis and malignant diseases of the lingual tonsil are best treated along the general lines laid down for the treatment of these diseases in any other part of the body.

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**Vicarious Menstruation.** M. A. SHLENKER AND A. E. FICKLIN,  
*New Orleans Med. and Surg. Jour.*, June, 1914.

The authors report a case of vicarious menstruation in a woman of nervous disposition but otherwise in normal condition. Menstruation commenced at sixteen but manifested itself entirely by bleeding from the nose. After three of these periods, which appeared at regular monthly intervals and persisted for three or four days, menstruation became normal although accompanied by much abdominal discomfort. The case was presented as suggesting a neurotic element in vicarious menstruation. There were no genital abnormalities.

SCHEPPEGRELL.

## AN UNCOMMON CASE OF NASAL HEMORRHAGE.

DR. JOHN A. THOMPSON, Cincinnati.

G. M. O., aged 63 years, was referred to me by his physician, Dr. S. S. Halderman, November 23, 1912. The symptom for which he sought relief was frequent attacks of nose-bleed. At times the flow was so free that his death from exhaustion was feared. These attacks had recurred with increasing frequency for several months. Examination of his nose at his first visit showed that the right middle turbinate was carious. There was pus in the anterior ethmoid cells. Clotted blood was adherent to the diseased membrane over these cells. The right inferior turbinate was enlarged, blue in color and irregular in shape.

The diseased ethmoid cells from which the blood was oozing when he came to the office were at once opened and the diseased portion of the middle turbinate removed.

The packing was taken out of the nose the next day and on the second day after the operation the patient went home. A specimen for microscopic examination was removed from the inferior turbinate. Dr. F. B. Samson later reported the specimen to be an angioma.

December 2, I was called to Portsmouth, since he was having a worse hemorrhage than any that had occurred before. This time the angioma was bleeding and at 1 a. m., under cocain anesthesia, the whole of the diseased inferior turbinate was removed. Some granulation tissue from the middle turbinate region was snared off at the same time.

January 23, 1913, the patient returned to the office with a history of bleeding from the remaining portion of the right middle turbinate and the diseased portion was removed. The bleeding was only temporarily checked by this operation and on March 20 the patient returned with a history of frequent epistaxis.

There was an old specific history in the case; so operation wounds did not heal promptly. Some granulation tissue was curetted from the site of the last operation and the patient sent to Christ Hospital for observation. Blood pressure tests were only a little higher than normal and only once was there a trace of albumin found in the urine. All bleeding stopped, while the patient was quiet in the hospital.

April 29, 1913, he again returned to the office with a history of repeated hemorrhages of increasing severity. The external wall of the nose whence the bleeding had previously been coming was normal scar tissue. This time the blood was flowing from a superficial ulceration low down on the right side of the septum. Nitrate of silver, 12 per cent solution, was applied and the nose packed. He returned home and under the care of his family physician the bleeding was controlled; so he had no more dangerous attacks for a time but was never entirely free from mild hemorrhages.

October 10, he called at the office and reported himself in good condition. December 5, he again returned with a history of profuse and frequent nasal hemorrhages. The septal cartilage was found to be softened and it was believed that the condition of the cartilage prevented a cure of the inflammation in the overlying mucosa. All the later hemorrhages had been from the septum in the right nostril. December 11, 1913, a submucous resection was made and the softened portion of the septal cartilage removed. The incision was made through the healthy mucous membrane in the left nostril. Healing was prompt and there have been no more hemorrhages.

There are two unusual features in this case. The right inferior turbinate body was all angiomatous tissue and when it started to bleed the hemorrhage could be controlled only by the complete removal of the tumor. The second unusual feature was the method of cure. If anyone has ever done a submucous resection for the cure of hemorrhage before, I have not seen a report of the case. One case has been reported where frequent nose-bleeds were stopped by a submucous resection, but the operation was not done to check them.

628 Elm Street.

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**Primary Lupus of the Larynx.** E. MAYER, *Med. Record*, June 27, 1914, p. 1162.

Three cases of lupus are presented, two of them primary. The affection is rare and is a chronic disease with but the slightest symptoms. It is usually accidentally discovered and the prognosis as to life is relatively good. Ed.

## SOCIETY PROCEEDINGS.

### NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

*Regular Meeting, May 7, 1914.*

DR. J. H. GUENTZER, CHAIRMAN.

DISCUSSION OF DR. FREUDENTHAL'S PAPER.

*(Continued from page 764, August, 1914.)*

If we can clean off the secretions from the surface at frequent intervals and keep it approximately clean, we can avert the secondary infection which causes a good deal of the trouble and much of the dysphagia, and so give the patient much relief from the pain. In addition, the frequent cleaning of the surface favors the healing of the ulceration.

The bulb is removed from the medicator, the glass is attached to the tube of a fountain syringe, and the larynx is irrigated.

It requires a little skill on the part of the patient to make use of these irrigations, for if not done skillfully they may cause coughing. The patient pinches the rubber tube, and introduces the glass into his mouth. When properly placed, he says, "Ah" and opens the tube by releasing the pressure with his finger.

At first it is difficult, and only a small amount of fluid is allowed to enter the mouth, but a skillful patient soon becomes accustomed to it and can keep the tube open for a long time, and get half an ounce of fluid into the throat. It requires a little skill on the part of the patient and only those should use it who can acquire its use. Dr. Yankauer said that he had not had a large experience in the use of these irrigations, but he hoped that those whose clinical facilities would permit would give it a fair trial; for if the larynx can be kept clean and prevent the secondary infection which usually follows every infection of the throat a great deal could be accomplished in the treatment of laryngeal tuberculosis.

DR. HERZIG suggested the employment of urea hydrochlorid for the relief of pain in these cases. He had used it in 10 to 20 per cent strength. He usually injects 5 to 10 minims of a 4 per cent solution at the junction of the nerve, the most painful portion, and the patient is comparatively free from pain for one to two days, and in this way the larynx is given a rest.

DR. GUTTMAN expressed his appreciation of the way in which Dr. Freudenthal had treated the subject, but had missed one thing, that is the ignipuncture, which had been recommended some years ago. He did not think that enough emphasis is laid on this method of treatment.

DR. FREUDENTHAL, closing the discussion, said that we often send patients to the Adirondacks where there are men who know how to treat pulmonary conditions. They are also sent to Liberty and other places, but

a gale that is blowing at the rate of sixty miles an hour is not good for many patients afflicted with laryngeal tuberculosis.

He had not seen the zinc inhaler used for stopping a cough, but would try it. He could not see any objection to the use of powder. The older laryngologists used hardly anything else. They had no sprays. It is used abroad a great deal. He himself has used zinc oxid and alum, and it worked. The powder must be absorbed, for the patients have no pain afterward.

He intended to try Dr. Yankauer's device, for the patients should be able to cleanse their larynges themselves, and afterward apply some other medication. If we can enable them to do this, we will have gained a great deal for them.

The injection of urea hydrochlorid suggested by Dr. Herzig was a new idea to him, but he could understand how it would act quite as well as alcohol, and perhaps better.

He had mentioned the igni-puncture referred to by Dr. Guttman. He had not been able to read the paper in full on account of the shortness of the time, but he employs it in solitary rather than in diffuse ulcerations.

In reply to an inquiry from Dr. Cocks as to what he thought was the best climate for laryngeal tuberculosis, Dr. Freudenthal said that that was a very difficult question to answer, but that in general it was about the same as for tuberculosis of the lungs. Some persons feel best at the seashore. Formerly patients were not sent to the seashore, but persons with a dry larynx do better when they go to the sea. This is frequently done in France, and he himself often sends his patients down to Coney Island in winter, and it does them good. Our seashore here is too hot for some patients in summer; they can go to the mountains. Other affections of the larynx do better in a very high, dry climate, like Arizona. As a general rule we cannot say that we would send a patient to this or that climate, but have to find out what is best in each individual case.

**Watermelon Seed Removed from Left Bronchus of a Child. DR. SIDNEY YANKAUER.**

The patient was a child, 3 years old, who inhaled this watermelon seed last August. It remained in the lung ever since, nine months. During this time, the child had a cough, which was not, however, continuous. At times the symptoms were very slight.

About two months ago, the parents consulted a competent pediatricist, who had an x-ray picture taken, which showed nothing. The child had so few physical signs, that he discredited the statement of the mother that the child had inhaled the watermelon seed.

When the child was brought to me two weeks ago, she had a very severe general bronchitis, with the peculiar rattling characteristic of foreign body. An x-ray picture was taken at Mount Sinai Hospital, which showed nothing at all. As soon as the bronchoscope was introduced, the child became cyanosed. When this subsided and the bronchoscope was introduced again, the foreign body was seen below the vocal cords, but before the forceps could be introduced it had disappeared. The instrument was then advanced to the bifurcation and the foreign body was seen in the left bronchus and removed without difficulty by the aid of the

forceps. The recovery was uneventful, and the child was sent home after a very short stay in the hospital.

The point of especial interest is that the foreign body was in the air passage for nine months without producing anything but a bronchitis, and during all that time the seed did not disintegrate. It was removed intact after nine months.

#### DISCUSSION.

DR. COCKS said that he had the pleasure of seeing Dr. Yankauer operate upon this case and it was done most skillfully. One should always be on guard in these cases, for in using the tube with an anesthetic a coughing spell is apt to ensue and the foreign body is likely to be dislodged and obstruct the glottis. He has had this experience last winter, and the child would have died had not an immediate tracheotomy been performed. In Dr. Yankauer's case, as soon as the child was put in a better position the dyspnea promptly subsided, and the doctor was able to continue. It is well always to have a tracheotomy set ready when performing bronchoscopy upon children.

DR. GUTTMAN asked on what grounds the bronchoscopy was made. As far as he could make out there were no special signs demanding it, nothing but a bronchitis. What was the indication for the bronchoscopy?

DR. YANKAUER said that in the first place there was a distinct history that the child had inhaled the watermelon seed, and had had a cough since that time. That alone would have been sufficient justification. In the second place, there was a marked bronchitis with the characteristic rattling rales which are only produced by a foreign body.

As to what Dr. Cocks had said about the anesthesia which might produce a cough and dislodge the foreign body, he had seen a case not long ago where a child had inhaled a brass carpet tack, similar to the one presented before the Section a few months before. The surgeon was about to insert the bronchoscope and had started the anesthesia, but after a few whiffs of the ether the child coughed out the tack.

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#### **Intra-nasal Operation for Frontal Sinus Suppuration.** P. WATSON-WILLIAMS, *Jour. of Laryngol.*, May, 1914.

Unless there are symptoms of intra-cranial complications, bone necrosis, osteomyelitis, or complicated ocular conditions the intra-nasal operation is always preferable to an external one. The Ingals or Halle operation is too dangerous, in the opinion of the author, and Williams indicates his own technic. Skiagrams should be made previous to operation.

ED.

## PHILADELPHIA LARYNGOLOGICAL SOCIETY.

*Special Meeting, June 25, 1914.*

DR. GEORGE M. COATES, Chairman.

### **Two Very Interesting Cases of Foreign Bodies in the Bronchi Removed by the Bronchoscope. DR. SHURLY. (By invitation.)**

A great many of our so-called foreign bodies are false alarms. They develop all the neurasthenic signs of the regular case. The first case is one in which the patient had a persistent cough of long standing, cough and expectoration being characteristic of incipient tuberculosis. It had been treated by numerous physicians, all without relief or proper diagnosis made.

The most peculiar characteristic was the smell of rubber perceptible at time of coughing. A radioscope picture located a foreign body in the right main bronchus. A history was now elicited of a tooth extracted some time previously and the breaking off of a piece of the rubber plate of a false set. Patient was admitted to hospital and etherized; bronchoscope passed and the rubber found, but before extraction could be done it was lost and could not be located again. The patient then recovered from the anesthesia and coughed it up.

A good plan, and one which must always be kept in mind, is when to stop with the bronchoscopic examination. This case illustrated that patients do not always know what is the matter, and all coughs of long standing should have an x-ray taken.

The second case was that of a pin embedded in the second bifurcation of the left bronchus of a child, and was illustrated with plates. There is great difficulty in locating a pin in the bronchus, it being sometimes impossible. Never do an external operation until the bronchoscopic examination has been most thorough.

The third case is that of a young lady, 22 years old, who had several teeth extracted under gas. The dentist, working fast in extracting teeth while the patient was under nitrous oxid dropped a tooth off of the forceps and it was inhaled into the bronchi. The bronchoscope was passed and the tooth extracted. We frequently have to go after foreign bodies several times.

### **A Case of Bi-lateral Recurrent Laryngeal Paralysis. DR. ANTONIE P. VOISLAWSKY. (By invitation.)**

E. W., colored, female; age, 17; single. Admitted to St. Luke's Hospital, New York City, March 7, 1914. The patient's chief complaint was difficulty in breathing. Her present illness began fifteen months ago when she was operated upon for goiter. After the wound had healed and she left the hospital she noticed difficulty in breathing, and for some time the attacks of difficulty in breathing lasted an hour or more. When talking she was obliged to stop and take a forced inspiration before continuing. Personal or past history is unimportant.



The physical examination shows a girl, fairly well nourished, who does not appear acutely or severely ill. Some difficulty in breathing and talking, inspiratory efforts labored. Articulation of words good. When asleep has a noisy respiratory stridor. Eyes, ears, mouth and neck are normal; lungs—resonance good. Inspiration prolonged and accompanied at times by an inspiratory moan. Abdomen and extremities negative. Laryngeal examination—vocal cords appear reddened, and separate slightly on inspiration, but the rest of breathing is in close apposition. There is no voluntary motion of the muscles supplied by the recurrent laryngeal. Blood, urine, blood-pressure, Wassermann and x-ray all negative. Pulse 56, respiration 44.

Three days after admission we were compelled to isolate the patient, as her crowing while asleep kept the rest of the patients awake. We resorted to intubation at bedtime; this relieved the dyspnea and stopped the crowing. Electricity, both galvanic and faradic, were administered, but without effect. On March 27, she was brought to the operating room, the larynx cocaineized and a Jackson pharyngoscope introduced and with a cordes punch the left vocal cord excised. For several days subsequently she was intubated and after the wound healed discharged from the hospital. The breathing was much easier, there was improvement in talking and the crowing was replaced with an ordinary snore. At the present time, there is a white band of scar tissue where the left cord excised, and, strange to say, the right cord and the band approximate.

**New Test for Labyrinthine Disease.** DR. EMERSON, of Boston. (By invitation.)

The best classification of specific disease of the labyrinth with which the writer is acquainted is that given by Kerrison in his late text-book. Here the clinical manifestations of syphilis of the labyrinth are divided into four classes. First, is a congenital type, seen in its most characteristic and easily recognized form in children exhibiting other stigmata of the disease. The aural lesion is usually bilateral, though one ear may be, and usually is, more seriously impaired than the other. Examination of the ears may reveal physically normal drum membranes, or the physical signs of middle-ear suppuration may render the syphilitic character of the labyrinthine affection less easy to recognize. The deafness is of distinctly labyrinth type and usually of advanced grade. Examination of the child shows in a certain percentage of cases the characteristic notched condition of the teeth (Hutchinson's). According to Fraser, this defect occurs in 50 per cent of cases. Interstitial keratitis is a defect occasionally found, as also are destructive lesions (defects) of the soft and hard palate. With or without these defects, the child not infrequently presents a stunted, prematurely old appearance which is more or less characteristic of these little unfortunates. The above abnormalities mark the most pronounced and, therefore, conspicuous form of congenital syphilis. There are many cases, however, in which the child does not exhibit such obvious stigmata, in which case a thorough physical examination, a careful analysis of the family history, and resort to the Wassermann test may be necessary to establish a correct diagnosis. The prognosis, as far as the auditory function is concerned, is hopeless.

The second variety of syphilitic labyrinthitis is that which occasionally complicates the acquired form of the disease in adults. It develops most frequently in the late secondary or in the tertiary stage, rarely in the primary stage of the disease. It is characterized clinically by very sudden and usually very extreme deafness in one or both ears. That the vestibular apparatus is also involved in a very large percentage of cases is shown by the frequent evidences of disturbed equilibrium, e. g., nystagmus, vertigo, static ataxia, etc. When the lesion is unilateral and completely annuls the function of the affected vestibular mechanism, the onset is necessarily characterized by all the usual phenomena of vestibular irritation or excitation. When both labyrinths are simultaneously paralyzed, the patient exhibits the type of vertigo and ataxia characteristic of vestibular paralysis. The writer has recorded the history of such a case in which the patient was absolutely deaf in both ears and both vestibular mechanisms were absolutely non-irritable by either rotation or the caloric test.

The clinical features of these cases usually leave in doubt the question as to whether the membranous labyrinth or the eighth nerve is the structure primarily attacked. Involvement of other cranial nerves and simultaneous and equal disturbances of both cochlear and vestibular functions would point to the nerve as the structure primarily attacked; while the escape of other cranial nerves plus unequal disturbances of the two branches of the eighth nerve would point rather strongly to a direct invasion of the labyrinth.

Aside from the very characteristic onset of the attack in a person whose drum membrane may show no morbid changes, there are usually other evidences of the disease in cuticular eruptions, mucous patches, etc., which, in conjunction with the history of an initial lesion, may leave no doubt as to the syphilitic origin of the labyrinthine disorder.

Though necessarily causing great anxiety, the prognosis is more favorable than any other form of syphilitic labyrinthitis.

Another clinical variety of the disease, the pathologic basis of which is not always so easily determined, is found in adults who have suffered from chronic constitutional syphilis over a period of years. The drum membranes may or may not show evidences of tympanic disease, which, if present, may represent an intercurrent and pathological independent lesion. Such a patient frequently gives a history of occasional attacks of vertigo of more or less pronounced type, or such attacks, having belonged to an earlier stage of the disease, may have ceased to annoy him. The diagnosis depends chiefly upon the labyrinthine character of the deafness, i. e., diminished bone-conduction, negative Rin  , loss of hearing for the highest musical tone, plus constitutional evidences of the disease. Very frequently the pharynx and nasal cavities show the cicatrices and perforations representing the typical lesions of an earlier stage.

Naturally the history of such a patient may be expected to furnish data of considerable diagnostic significance. To other manifestations of the disease, the Wassermann test contributes the strongest corroborative evidence.

The lesion from which it is in some cases most difficult to differentiate chronic syphilitic labyrinthitis is that form of otosclerosis which involves

not only the labyrinthine capsule but also the membranous cochlea. Between these two conditions a positive differentiation is not in all cases possible. The history of a very sudden development of the deafness, coming on in the late secondary or in the tertiary stage of acquired syphilis, would go far toward establishing the syphilitic character of the labyrinthine lesion.

The treatment in these cases is the treatment of chronic syphilis. The prognosis, so far as any marked improvement of hearing is concerned, is unfavorable.

The fourth clinical type may be dealt with briefly. It is found in patients who are victims of constitutional syphilis of long standing, and whose ears exhibit the physical characteristics of a middle-ear suppuration (usually of offensive type) and the functional reactions of labyrinthine disease. The syphilitic nature of the labyrinthine lesion is usually an hypothesis not susceptible of definite proof. It is, however, an hypothesis of very practical importance, for the reason that improvement, either functional or of the concomitant suppurative lesion of the middle ear, is not likely to result from any plan of local treatment not reinforced by active measures to eradicate the constitutional disease.

*Treatment:* There is no manifestation of syphilis which calls more urgently for vigorous efforts to eradicate the systematic poison than syphilitic labyrinthitis. The question of treatment resolves itself into a comparison of the few drugs of known value and the best methods of administering them. The more important phases of this subject are discussed in the chapter devoted to the use of salvarsan in aural therapy.

This classification coincides with the previous experience of the writer. The use of the Wassermann, Nogouchi and provocative tests, however, have shown us that many more chronic morbid processes involving bone and nerve tissue, have syphilis as the underlying cause, than we have supposed. While in the past we have in some cases of labyrinthitis suspected that specific disease was the underlying cause, yet these cases were, for the most part, accompanied by pronounced and sudden deafness. A careful history usually elicited the fact that vertigo, nystagmus, rheumatism, or characteristic headaches—either one or all, had at some time existed. This suspicion of venereal infection was often further confirmed by physical examination.

It is to the laboratory that we are indebted for the means to determine definitely that many cases of specific labyrinthitis may develop slowly without the stormy clinical phenomena usually associated with our previous conception of involvement of the inner ear from lues and presumably vestibular irritation. It is the purpose of this short paper to submit a hearing test which the writer has found useful as a diagnostic guide to specific labyrinthitis. At the time of the study of ten cases of labyrinthitis (of which only one will be given as typical) the writer had never seen the following statements advanced as of significance in determining this specific origin.

Given a bilateral affection with marked lowering of the upper notes, a positive Rinné and normal low limits for the Dench fork, and the cause is usually syphilis. Eight cases out of ten so studied showed the Wassermann test either double or triple positive. The upper limits, as shown

by the whispered voice, were reduced to 1.25, or 1.35, by the low voice. These cases would confirm in this clinical manifestation to Kerrison's third classification. He, however, depends for his diagnosis upon the diminished bone-conduction, negative Rinné, loss of hearing for the highest musical tone, plus constitutional evidences of that disease. In the writer's case the air and bone-conductions were both lowered, but their normal ration remained the same. The Rinné was positive in every case. On looking up the literature, the writer ran across a note in which Urban makes the same statement. This, with a line in Politzer quoting Rohrer to the same effect, was all the reference obtainable. Politzer lays stress, however, upon a previous history of vertigo, nystagmus, headaches, or rheumatism, which was not obtainable in these cases, the history being one of slowly progressive loss of hearing with only the hearing test to suggest a specific origin.

A typical case is the following: James M., 31 years, widower, two children, venereal disease nineteen years. Under treatment two years on two different occasions. The specific history was denied at the time, but obtained later. History of deafness with tinnitus twelve months. No history of headaches or rheumatism. On examination, the septum showed marked deviation to the right. Large posterior ends of the turbinates both inferior and middle. There was also an active epipharyngitis. The tympanic membranes were indrawn and thickened and the luster diminished. The hearing test was as follows: Right ear 1/35 V.; left ear 2/25 V. Right ear, air conduction 25", bone conduction 15"; left ear air conduction, 40", bone conduction 15". Weber to the right. Right ear, D. 64; left ear D. 64.

There was sufficient cause in the nose and throat to account for the trouble in the middle ear, but here the loss was markedly in the highest musical tone. The duration was only a year; the affection bilateral; the Rinne positive and the lowest notes unchanged. A Wassermann was triple positive.

**Vaccines in Nose, Throat and Sinus Infections.** DR. G. H. SHERMAN (by invitation).

The therapeutic application of bacterial vaccines in nose, throat and sinus infections involves the same fundamental principles which obtain in vaccine therapy as applied to localized infections in other parts of the body. It is now well known that acquired resistance to infecting organisms is the most important factor in avoiding and overcoming disease, and from our present knowledge concerning infections it is also apparent that these immunizing activities are essentially developed by the tissue actively involved in the process of infection.

When we have localized infection usually but a comparatively small portion of the body is involved. This is particularly the case in nose, throat and sinus infections. Not much tissue being involved in these cases, sufficient immunizing substances to bring about adequate constitutional resistance—thus properly backing up the involved tissue cells in their fight to overcome the infection—is slowly developed. The natural result is that in many cases these infections become chronic.

Let us consider the nasal mucous membrane one thirty-second of an inch thick. This would require thirty-two square inches to make one inch

of tissue. Let us say with the submucous tissues we have a surface one-sixteenth of an inch thick, then it would require sixteen square inches to make a cubic inch of tissue. Compared to the body weight this is but a small fraction. All the rest of the body is practically inactive in the immunizing process.

In the treatment of these localized infections with bacterial vaccines we aim to call some of these inactive healthy tissues into active immuno-producers and thus build up a systematic resistance to aid the infected tissues in overcoming the infection. By injecting a sufficient number of killed organisms under the skin a much larger amount of tissue becomes actively engaged in producing antibodies than what takes place in the nasal mucous membrane. Furthermore, clinical experience shows that a more marked immunizing response is obtained from the injection of killed bacteria than from an active infection. This may be accounted for on the ground that living germs have a very deviating destructive influence on tissue cells by the digestive enzymes they produce and also by a probable toxic autolysis. When dead bacteria are injected into the body, no digestive enzymes are created that have a destructive action on surrounding tissues, nor does there occur an autolysis with production of toxic materials that would inhibit immunization. Therefore the entire cell energy can devote itself to the production of immunizing substances and consequently there results a larger measure of immunity than the progressive infection is capable of producing.

Necessarily to successfully treat infections with bacterial vaccines the same variety of organisms must be contained in the vaccines that are present in the infection. In nose, throat and sinus infections mixed infections almost invariably exist of which pneumococcus, streptococcus, staphylococcus and the micrococcus catarrhalis are the most common. Where single organism infections exist complicating infection will soon develop. For this reason a combined vaccine containing the principal infecting organisms is preferably employed.

The best results are obtained in the early acute stages. By using the vaccines early, enough immunizing resistance may be developed in time to prevent the excessive inflammatory deposits which interfere with drainage and consequently rapid recovery will take place. In advanced cases where surgical and other measures are necessary, bacterial vaccines are valuable adjunct remedies in aiding to overcome the infection and establish a permanent cure.

The slow development of a systemic resistance to acute infections of the upper respiratory tract is often responsible for serious troubles following these so-called "colds." From these acute, localized infections pneumococci or streptococci often gain entrance to the blood current. This may lead to serious pneumonia, broncho-pneumonia, endocarditis, inflammatory rheumatism, nephritis or other localized infections.

Infecting organisms while circulating in the blood do not stimulate a material production of resisting antibodies. These antibodies are only actively produced after the infection has localized in some tissue and a localized inflammatory process has been established. For this reason it is very important to treat these acute localized infections with bacterial vaccines because by this means tissue activity for the production of anti-

bodies is stimulated and a systemic resistance to the invading organism established while the infection is still a minor local affair. From these considerations the importance of giving bacterial vaccines in infections of the upper respiratory tract is quite obvious.

Dr. MOSHER explained and gave a demonstration on numerous dry specimens of his new operator for the exenteration of the ethmoid capsule. Dr. Mosher has designed a long, sharp-peaked curette for this operation:

*Technic:* After the parts have been thoroughly cocaineized the curette is inserted between the ethmoid capsule and septum as high up as possible and about one-half inch from the anterior insertion of the middle turbinate. The sharp peak of the curette is forced into the ethmoid capsule going through the entire thickness. All the tissue, that is the anterior portion of the middle turbinate, is removed with the curette as are also all of the ethmoid cells lying between the middle turbinate and the lateral wall of the nose. The middle turbinate acts as a guide and protects the cribriform plate of the ethmoid during the curettment. The remaining pendulous turbinate is removed last by biting-forceps; thus completing the operation.

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**Treatment and Prophylaxis of Peri-tonsillar Abscess.** LEVINGER, *Muench. Med. Wchnschr.*, June 9, 1914.

Incisions for peri-tonsillar abscesses often prove insufficient and sometimes close and cause retention. If the case is seen early before the jaw becomes very rigid the author opens the abscess by dissecting the upper pole of the tonsil and removing it with its capsule. This obtains thorough drainage and prevents retention.

ED.

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**Diseases of the Maxillary Sinus.** G. W. MACKENZIE, *Jour. of Ophth. Otol. and Laryngol.*, May, 1914, p. 199.

In maxillary sinusitis, osteomyelitis, caries, necrosis foreign body in the antrum or dentigerous cysts the diagnosis is often doubtful, since the affection may be of either endonasal or dental origin, and the rhinologist and dentist should work hand in hand.

ED.



